THE EFFECTS OF SENSITIZATION TO TEXT STRUCTURE AND HEADINGS AS CUES TO TEXT STRUCTURE ON THE QUANTITY AND ORGANIZATION OF FIFTH GRADE STUDENTS' DELAYED WRITTEN RECALL OF EXPOSITORY PROSE

by

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The effects of instruction focusing on sensitizing fifth grade students to expository text structure and headings as cues to structure were investigated. Measures of quantity and organization of ideas in delayed written recall were examined prior to and subsequent to treatment. Experimental instruction focusing on headings and organization of propositions in text was compared with the more conventional classroom procedure of answering questions after reading expository text. The experimental instruction group had higher scores for quantity and organization of ideas in delayed written recall. Further analysis revealed that subjects in the experimental group used more headings in recall than the conventional group. Ability level was not a significant factor for either group. Implications for instruction and further research are discussed.
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CHAPTER I: Introduction

A. Statement of the Problem

The study examines the effects of training for sensitization to text structure and headings on the amount and organization of ideas generated in delayed written recall of content material by fifth grade students.

B. Rationale for the Study

Educators have long recognized that students progressing through the grades need to process increasing amounts of information presented in content materials (Baumann, 1984; Carter & Carrier, 1976; Estes & Vaughan, Jr., 1978; McKee, 1948; Shores, 1943; Smith, 1964). This need stems largely from the common use of descriptive or information/classification text in intermediate grade content textbooks. Although a need exists it is generally agreed that students at all grade levels experience difficulty reading for comprehension and recall of expository materials. In fact, it is evident that many elementary and secondary students are not proficient at comprehending expository materials (Baumann, 1984; Moore, Readence & Rickelman, 1983; Stables, 1985).

Results of studies indicate that adults and children are not naturally able to internalize text (Taylor, 1980). In addition, it has been suggested that elementary students have no inherent proficiency in comprehending the gist or superordinate ideas of expository selections (Baumann, 1983).

Because of this lack of proficiency the question of how good readers organize and recall information has been addressed by a number of investigators. Results have shown
that text structure influences the reader's ability to process material (Carol & Freedle, 1972; Danner, 1976). It has been noted that different types of text, narrative and expository, require different reading strategies (Robinson & Hall, 1941). Results showed that poor readers read expository and narrative materials without altering speed, while superior readers, as defined by comprehension scores, adjusted reading rates to accommodate differential structure and concept loads.

Since the reading of expository text is so important and efficient processing seems to require that the reader is sensitive to the organization and structure of text, a closer examination of the nature of expository text may provide insight. Researchers and theorists have postulated that the organizational structures of expository text are such that concept loads are higher for expository than for narrative material. Descriptive text structure gives information about a topic by presenting attributes, specifics, explanations or settings. Some propositions are subordinate to others. Frequently the superordinate proposition is stated first, followed by the supporting propositions which may add examples or additional qualities. Typically, the "who, what, when, where and why" of a topic are included in descriptive passages (Meyer, 1984). In general, because each subordinate proposition or detail in content material may be necessary to understand the major or superordinate propositions the concept load is high. For example, understanding the superordinate statement "Crustaceans can be recognized by their firm crust-like outerbodies" is likely to depend on internalizing related details such as "crabs are crustaceans" and "lobsters are crustaceans." Understanding propositions in narrative tends to be less dependent on related ideas. For example, understanding the main statement "The car moved quickly down the dirt road" does not depend on accompanying details such as "goldenrod grew at the sides" and "great clouds of dust billowed behind."
Another example of the importance of text structure or organization is evident in Danner's work. Results obtained from his study (1976) revealed that the degree of comprehension displayed by elementary students varied with manipulation of text structure. Readers best able to comprehend and recall appear to reflect the text structure most closely in their production of oral and written recall (Alverman, 1981; Aulls, 1975; Carter & Carrier, 1976; Holley, 1981; Pichert & Anderson, 1977; Stables, 1985). For example, recall of passages in which details are disordered in relation to the main idea is more difficult than recall of passages in which supporting propositions are associated with the appropriate major proposition (Aulls, 1975). Since text structures do seem to differ researchers have been interested in the question of whether the reader's recognition and internalization of text structure or organization can be raised. This has chiefly been examined through the use of advance sensitization or organizers. Attempts by educators to manipulate the reader's conceptual structure are generally consistent with theoretical models proposed to account for the processes of text comprehension. It is thought to be necessary for the reader to internalize a representation of the major concepts, variously referred to as subsuming concepts (Ausubel, 1960), main ideas, superordinate concepts, or macropropositions (Kintsch & van Dijk, 1978). Internalization of macropropositions in turn is thought to facilitate processing and recall of micropropositions (details).

Various organizational aids or "organizers" have been devised in efforts to facilitate the internalization of macrostructure or main ideas. Organizers may be paragraph abstracts, sentence outlines, hierarchical outlines, headings or pretests. Research findings related to conceptual organizers tend to be supportive of the theories mentioned previously. Generally speaking, those organizers shown to improve retention and recall specifically identify the macrostructure of the text (Aulls, 1975; Ausubel, 1960; Ausubel & Fitzgerald, 1961; Brooks, 1983; Glynn & Di Vesta, 1977; Proger, 1970; Slater et al.,
1985). For example, paragraph abstracts which introduce the major points of a text are more effective than paragraph abstracts which provide historical background (Ausubel, 1960, 1961); sentence outlines which identify the main points of the text are more effective than pretests which do not provide information about the main points (Proger, Taylor, Mann, Coulson & Bayak, 1970); descriptions of passage organization accompanied by an outline of major points are more effective than descriptions alone (Slater, Graves & Piché, 1985); in some studies presence of outlines or headings which identify main points have been shown to facilitate recall (Holley, Dansereau, Evans, Collins, Brooks & Larson, 1981).

Another critical factor with respect to the types of organizers found to be effective (those based on macrostructure or main points) seems to be the order of presentation. While organizers can be presented prior to, concurrent with, or following the reading of the text, effectiveness has not been demonstrated for the latter. The locus of effect for organizers appears to be at encoding (Mayer & Bromage, 1985).

Although the consensus based on research is that macrostructure type organizers are effective when used at encoding, there are some studies in which these organizers did not appear to facilitate recall or comprehension. Studies in which organizers, such as headings or outlines, which reflected the macrostructure were ineffective can be discussed in terms of two factors: the type of recall measure used; and the presence or absence of training.

With regard to the first factor, studies in which no significant effects were associated with these organizers generally measured immediate, rather than delayed recall; recall tended to be cued rather than free; and little or no training was employed. For example, there is some indication that cued recall is less difficult than free recall (Baumann, 1981). Free recall seems to afford a closer picture of the reader's mental processes and when recall is delayed, the effects of organizers seem to be more apparent.
With reference to the second factor, training, it seems that many of the researchers investigating the effects of organizers (Ausubel, 1960; Ausubel & Fitzgerald, 1961; Christensen & Stordahl, 1955; Pichert & Anderson, 1977; Proger et al., 1970; Slater et al., 1985) have overlooked an important point. Most organizational aids such as headings, outlines and abstracts are not inherently useful. They can only be used if the reader is made aware of their intended function.

Even though the above mentioned factors have been overlooked in a number of studies, researchers generally agree with the argument for training readers to recognize and use macrostructure organizers as cues to text structure (Alverman, 1982; Baumann, 1983; Brooks et al., 1983). In spite of this agreement, few studies have examined the effectiveness of such training; and those which have are either based on older subjects or have produced mixed and inconclusive results (Alverman, 1982; Brooks et al., 1983; Holley et al., 1983; Taylor, 1980; Taylor & Beach, 1984).

Because of the inconclusive results of studies based on young children the question of whether the ability to internalize a conceptual representation of text macrostructure is dependent on developmental readiness or training must be considered. Many educators, including Estes and Vaughan, Jr. (1978) do believe that content reading, or reading to learn, is developmental in nature. Indeed, some findings appear to support this notion. Most recently, Stables (1985) found that students at the grades five and six levels appeared to be unable to use headings as an aid to recall comprehension on grade three and grade level passages. In comparing the performance of these students to that of students in two parallel studies, grades seven through ten, Stables concluded that the ability to use headings as cues to structure was developmental.

It is possible that the failure of fifth and sixth grade students to use headings is not entirely developmental. The failure of early intermediate students to use headings
may represent a lack of training and instruction rather than a lack of cognitive maturity or readiness. This lack of training may be the result of little instruction for content reading comprehension taking place at the elementary level (Durkin, 1978–79).

Baumann (1984) has also supported the idea that the general lack of sensitivity to expository structure shown by elementary students may not stem from a lack of readiness. Instead, Baumann argues that elementary students are not as sensitive to expository structure as they are to narrative, partly because they have had less exposure to expository material. Like Durkin, he notes that instruction for reading in the content area is not emphasized to the same degree as instruction for narrative reading.

Summary

In summary, major findings and questions raised by contemporary research should be reviewed. The body of literature has recognized the problem of increasing quantities of content materials throughout the grades. As well, the difficulties in comprehension and recall experienced by elementary students have been noted. Recognition of these two facts has led to investigations of the influence of text organization and organizational aids.

Educators have theorized that internalizing the macrostructure of the text is key to comprehension and recall. The evidence suggests that recognizing the organization inherent in the text as well as carefully constructed organizational aids can help the reader internalize the text. Although organizers such as headings have been shown in many instances to be effective, the relative importance of training and developmental factors remains unclear in relation to upper elementary students. It is not clear whether the failure of fifth grade students to utilize structure and headings as structural cues can be overcome.
C. Purpose of the Study

It is apparent that elementary students receive little instruction for comprehension in content fields. This is not because teachers do not want students to understand. More likely, this is a symptom of not knowing what can be done to improve comprehension or at what level children can be taught to comprehend expository material.

Contemporary research suggests that readers who are sensitive to the structure of expository text have better comprehension and recall of the material read than do students who do not demonstrate sensitivity to text structure. It appears that cues to macrostructure in the form of concurrent organizers, such as headings, can facilitate recall if readers are sensitized or trained for their use (Brooks et al., 1983; Holley et al., 1981).

It was the purpose of this study to determine whether students could be trained to be sensitive to descriptive text structure, and headings as cues to that structure; and whether sensitization would increase the amount and organization of ideas produced by fifth grade students in delayed written recall.

Specifically, the questions were:

1. Would it be possible to sensitize fifth grade students to descriptive text structure and headings as cues to that structure?

2. Would fifth grade students, trained to be sensitive to descriptive text structure, and headings as cues to that structure, demonstrate superior performance over students receiving conventional instruction on measures of quantity and organization of ideas in delayed written recall?

3. Would the ability levels of fifth grade students influence performance on measures of quantity and organization of ideas in delayed written recall?
4. Would there be an interaction between treatments and ability levels as observed on measures of quantity and organization of ideas in delayed written recall?

To answer these questions, six null hypotheses were formulated:

- **Ho₁**: There will be no significant difference between the treatment groups in their adjusted mean posttest performance on the quantity of ideas in delayed written recall.

- **Ho₂**: There will be no significant difference between the three reading ability groups in their adjusted mean posttest performance on the quantity of ideas in delayed written recall.

- **Ho₃**: There will be no significant interaction between student membership in both independent variable populations (treatment and reading ability) and their adjusted mean posttest scores for quantity of ideas in delayed written recall.

- **Ho₄**: There will be no significant difference between the treatment groups in their adjusted mean posttest performance on the organization of ideas in delayed written recall.

- **Ho₅**: There will be no significant difference between the three reading ability groups in their adjusted mean posttest performance on the organization of ideas in delayed written recall.

- **Ho₆**: There will be no significant interaction between student membership in both independent variable populations and their adjusted mean posttest scores for organization of ideas in delayed written recall.

**D. Significance of the Study**

The study was seen as having potential importance for students, educators and publishers. General levels of comprehension for expository material could be improved if training for sensitization to headings and text structure were shown to be effective. The study would provide insight into the processes behind internalizing what is read and the degree to which upper elementary students can utilize expository text.
E. Limitations of the Study

Several limitations were anticipated. The use of non-random intact classes was compensated for by the use of analysis of covariance to minimize initial differences. Generalizations beyond the sample, experimental conditions and time of year should be made with caution.

F. Definitions

collection load: the number of key micropropositions in relation to macropropositions; high concept load implies that understanding micropropositions is key to understanding macropropositions; comprehension of macropropositions in text of low concept load is less dependent on micropropositions.
delayed recall: written free recall given one or more days after exposure to target material; for the purpose of this study, one day after exposure.
heading: a word or phrase set apart above a paragraph, which reflects the explicit or implicit main idea for that paragraph.
information/classification text: also referred to as descriptive text; expository text written in a style which classifies and presents details of attributes, specifics, settings or explanations.
macropropositions: statement of main idea; statement which encompasses or subsumes details or micropropositions.
macrostructure: refers to the explicit or implicit main ideas or gist of a passage; may include title, headings and macropropositions.
micropropositions: details related to or supporting an explicit or implicit main idea.
organization of recall: weighted score for the arrangement of micropropositions (See
Scoring Procedures).

quantity of recall: number of ideas or propositions recalled from information/classification (descriptive) passages.

sensitization: the process of actively drawing attention to, or developing awareness of stimuli. For the purpose of this study sensitization refers to the procedures used to increase the learner's awareness of and responses to text structure and headings. As well, it refers to awareness, as opposed to lack of awareness, on the part of the learner.

text structure: the organization and content of the text.

G. Organization of the Thesis

The thesis is organized with five chapters. Chapter I presents the problem and rationale for the study. Chapter II reviews the related literature. Chapter III describes the methods and procedures of the study. Chapter IV presents the results of data analyses. The final Chapter summarizes the study and presents conclusions, limitations and implications.
CHAPTER II: Review of the Literature

This review will focus on three main areas of the literature. The first section presents studies which have examined the influence of text structure on the reader.

The second section presents those studies which have dealt with facilitating comprehension through manipulation of the reader's conceptual structure. The discussion will deal primarily with advance organizers.

The final section discusses studies which have used, or recommended, training for the use of an organizer to facilitate comprehension and recall.

A. Text Structure and Coherence

This section will review research dealing with aspects of text structure and coherence as they relate to reading comprehension and recall.

The content structure of text typically has three aspects: top-level structure, macropropositions and micropropositions. Top-level structures are ways of organizing topics, but they are separate from the topics themselves. That is, top-level structures can take such forms as comparison, antecedent/consequence, commonality or description. Macropropositions correspond to the main ideas or gist of the text while micropropositions correspond to the details. Micropropositions are referentially connected to a macroproposition or main idea. Together, macropropositions can form the macrostructure of the text (Meyer, 1984).

If macropropositions are not logically placed in reference to their micropropositions, the structure can become indistinguishable and comprehension will become difficult, if not impossible. It can be inferred from research that similar comprehension difficulties occur
when the structural relationship between macro- and micro- propositions is intact, but not perceived by the reader.

A number of educators and researchers have emphasized the important influence of text structure and coherence on the ability of readers to derive and recall meaning from text.

As previously cited, Robinson and Hall (1941) observed that differing text structure resulted in the adjustment of reading rates for good college-level readers. Two hundred and five students were given five reading rate and comprehension accuracy tests, consisting of single art, geology and fiction selections and two history selections. Rate scores were in terms of word counts at the end of three, six and nine minutes. Comprehension questions were based on main ideas and scored as the percent correct of those questions relating to the amount of text read by the end of nine minutes.

It was observed that average rate scores tended to be more comparable among subjects for the first three minutes of reading than the last six. The average rate of reading was highest for the fiction selection. As well, better readers, as measured by comprehension accuracy, reduced their reading rates after the first three minutes of reading information text. Poor readers failed to adjust their reading rates. The authors speculated that good readers recognized the organization and increasing number of ideas and slowed reading to facilitate assimilation.

Intercorrelations among individual comprehension scores on the four subject areas (art, geology, fiction and history) were below .50. The correlation between the scores on the two history measures (Canadian history and Russian history) was .98. Robinson and Hall (1941) interpreted these findings as indicative of variations in text structure between subject areas. Thus, different text structures required differential reading rates in order to facilitate comprehension. Or, viewed another way, those readers who did not respond to
differences in text structure by adjusting their reading rate demonstrated low comprehension.

Although the Robinson and Hall study (1941) provides insight into the requirements of effective expository reading, it is not clear that the measure of comprehension accuracy used to identify good and poor readers was valid. As the subjects did not all read equal amounts or answer an equal number of questions it may not be appropriate to compare their percentage scores.

Nila Banton Smith (1964) also noted that different subject areas have different patterns of writing. As well, Smith advised that prose structure be considered in comprehension instruction.

Speculations by Carol and Freedle (1972) that the inherent organization or structure of the text may act as a form of plan, influencing the reader's internalization and/or recall of information, led to a study by Aulls (1975). Aulls investigated the structural properties which influence literal recall of expository text by manipulating the subtopic structure. Paragraphs in which the details occurred consecutively in reference to the appropriate main idea were considered "compact." Paragraphs in which details were disordered in relation to the main idea were termed "discontinuous." It was hypothesized that compact subtopic structure would facilitate recall more than discontinuous subtopic structure. Secondly, since the author wanted to establish the importance of a main idea statement in expository text, he predicted recall scores would be significantly higher when main ideas were present than when they were absent.

A total of 128 sixth-grade students reading at or above grade level on the Gates-MacGinitie reading test were randomly selected from two upper middle class schools. They were then assigned randomly to eight groups of sixteen and presented with one of several expository paragraphs to be read, followed by a free recall task.
Paragraphs were written at the grade five level and varied in structure and meaningfulness.

A 2 x 4 x 2 factorial design was used in the experiment. Two levels of internal structure were used (compact and discontinuous). Four levels of external structure were examined (title, macroproposition, title and macroproposition, no title or macroproposition). As well, two levels of meaningfulness were used (content expected to and content not expected to elicit prior knowledge).

The mean number of idea units recalled by each treatment group was calculated and the variable effects were analyzed using a mixed ANOVA. Internal paragraph structure was shown to influence recall significantly, with compact internal structure (details) yielding significantly higher recall than discontinuous structure. The effect of external structure (titles and main idea) alone was not significant and there were no significant interactions between internal and external structure. A significant interaction was noted between external structure and meaningfulness. Passages of high meaning with external structure produced higher recall scores. The meaningfulness of content was observed to have a highly significant effect on the recall of idea units. Aulls reported that the more meaningful paragraph content used in his study resulted in an average of one third more idea units recalled than the paragraphs where the content was not expected to be meaningful.

The fact that the influence of external structure (titles and main ideas) was independent of internal structure led Aulls to suggest that little evidence supports the notion that recall depends upon the referential connections between macropropositions and micropropositions.

However, several aspects of Aulls' study should be considered before conclusions are drawn. The subjects are representative only of competent sixth-grade readers and
differential effects might be observed with different ability levels. As well, sample sizes for each variable were relatively small.

As the results are based on an initial reading of the paragraph, subjects may have lacked the time (or ability) to seek out structural cues and failed as a group to recognize referential connections. Alternately, being good readers, they may have been able to infer macropropositions when they were not present. If the first were true, it would be wise not to equate recall with understanding in this case. It is reasonable to question what degree of understanding existed if subjects were truly unaffected by the presence or absence of main idea statements, or macropropositions.

Although external structure (headings, macropropositions) did not appear to facilitate recall this should not suggest that it does not or can not facilitate recall. The use of immediate recall may have masked the effects of external structure. (Evidence to this effect will be presented in the following section.)

Aulls' study does lend support to the idea that internal structure may function as a kind of retrieval plan for the reader.

Bower, Clark, Lesgold and Winzens (1969) suggested that the reader's construction of a retrieval plan and subsequent recall of information is dependent on the degree to which the inherent organizational structure of the passage is apparent to the reader. Using Bower et al.'s suggestion as a starting point, Carter and Carrier (1976) also studied the effects of prose organization on recall. In two experiments with university students they found that repeated exposures to materials with complex substructure improved recall, and materials in which the organizational structure of the text was made more salient produced better recall than materials in which organization was scrambled.

A 2 x 2 x 2 x 2 factorial design was used in the first experiment (Carter & Carrier, 1976) with one hundred and forty-four first and second university students who
were paid volunteers. The passage used in this research was described as having an elaborate conceptual structure in which micropropositions were definable in terms of class inclusion. By manipulating the order in which sentences were presented, two versions of the passage were created for the first variable, one with high structural salience, the other with low. The second variable resulted from manipulating the placement of superordinate sentences (macropropositions) in the passage. The third variable in the study was repeated reading of the passage: massed in one session, versus repeated reading, distributed over time. The final variable was ability level.

It was predicted that high organizational salience would lead to superior recall, as would distributed repetition. As well, it was expected that low ability subjects would benefit more from the high organizational salience and advance placement of macropropositions conditions than would the high ability subjects.

Contrary to expectations, both organizational salience and placement of superordinate sentences failed to influence recall as main effects. The data did support the prediction that distributed repetition of reading would facilitate greater recall than massed repetition.

The authors suggested that the implications of their findings were such that even if there is an inherent structure in text, much time spent worrying about sequences, hierarchies and superordinate sentences may be unwarranted. However, this conclusion might have been somewhat hasty. There was some evidence that the readers of passages with low organizational salience inferred or reconstructed structure. Clustering of ideas in their recall protocols was beyond the chance level which suggests that lack of organization induced the reader to impose structure. As well, the relative ability levels of the subjects may have been exaggerated. The ability groups were established by dividing the sample at the median of distribution on the Wide Range Vocabulary Test. As neither the range nor group means were reported, the degree to which the groups differed is
In a second similar experiment using eighty-four subjects, Carter and Carrier (1976) observed that logically sequenced materials produced reliably greater recall than randomly sequenced materials. However, it was noted that this effect was only for several exposures to a passage, rather than one.

Viewed collectively, the two studies provide somewhat conflicting evidence of the influence of text structure on recall. It is possible that the relative sophistication of some subjects enabled them to organize scrambled materials.

Another example of the influence of text structure is seen in one aspect of Glynn and Di Vesta's (1977) examination of outline and hierarchical organization as aids for study and retrieval of information. Undergraduate subjects forming a sample of one hundred and twenty showed no significant differences in amount of ideas when recalling hierarchically organized or scrambled information. However, they were better able to generate new thematically correct combinations when recalling organized text. The authors suggest that this particular effect is important because true comprehension involves not only retrieval of isolated facts, but also involves legitimate combination of newly acquired and established information.

Danner's (1976) investigation of children's understanding of intersentence organization adds to our understanding of the effects of text structure. A total of 72 middle-class students from grades two, four and six were studied on a series of oral recall, sorting and selection of review notes tasks. Subjects were given a twelve sentence expository passage either topically ordered or disordered. In all three grades, both clustering and recall of ideas was better for topically organized passages. It was observed that the number of students who noticed that passages were structurally different, who sorted ideas by topics and who chose review notes on the basis of passage structure
increased with age.

Danner's (1976) findings support the notion of a developing awareness of the utility of organization for aiding recall. It should be noted, however, that sample sizes for each grade were relatively small (24) and examination of the ranges and means of grade equivalent reading scores suggests that few students were reading at the second grade level and a number were reading above the sixth grade level. As well, both twelve sentence passages presented to subjects were markedly simplistic and had readability levels at low grade two. The differences observed between grades may not have practical significance. It is possible that older readers might experience difficulty in utilizing structure, equal to that of younger students, were they to read material closer to their own instructional levels. As well, it should be noted that only two subjects spontaneously attributed their greater difficulty with the disorganized passage to the disruption of its structure. This suggests that readers may be influenced by, yet not consciously recognize, text structure.

Taylor (1980) provided further evidence of differential effects of text structure with increasing age and reading ability. She constructed two passages, identical except that some words in the first version were substituted by more difficult synonyms to create a more difficult version. The less difficult fourth-grade passage was read by seventeen fourth-grade good readers. The more difficult sixth-grade version was read by seventeen sixth-grade good readers, seventeen sixth-grade poor readers and seventeen adults.

Higher performance on immediate and delayed recall of expository text for good readers was observed, increasing with age. In general, the oral recall protocols of adults and sixth-grade good readers more closely paralleled the text structure than did the recall of the other two groups. For sixth grade, no differences were found between good and poor readers on immediate recall. However, on delayed recall, good and poor readers
whose recall reflected text structure performed significantly higher than those who did not follow the structure. Taylor concluded that better and more mature readers attend more closely to the features of the text structure.

Although Taylor's study (1980) was also characterized by relatively small samples, it is important because it examined both immediate and delayed recall. The results indicate that differences are more likely to be found at delayed recall.

The use of varied criterion measures in examining the influence of text structure has made it difficult to compare studies. Robinson and Hall (1941) and Carter and Carrier (1976) used cued recall and examined different aspects of text structure. Immediate written recall measures were used by Aulls (1975), Carter and Carrier (1976) and Glynn and Di Vesta (1976). Danner used immediate oral recall. Only Taylor (1980) examined both immediate and delayed written recall.

There has been a general failure to examine the ability level of the reader relative to the criterion measure. Some studies have used materials of low readability with both competent and less than competent readers, or mature and younger readers.

The body of literature concerning the influence of text structure has not been able to isolate the effect of structure from the reader's ability to impose structure. This is primarily because most research has been conducted with relatively sophisticated readers.

**B. Conceptual Structuring**

Because internalization of the text structure apparently influences comprehension and recall, conceptual structuring became a focus for theorists and investigators.

One of the earliest studies to examine the effects of organizational aids on comprehension and retention was that conducted by Christensen and Stordahl (1955). The
study was concerned with different methods of indicating the structure of expository material with reference to their differential effects on immediate and delayed recall.

Using nine flights of Air Force trainees the authors examined the effects of thirty-six experimental combinations of:

   a) outlines at beginning
   b) summary at beginning
   c) summary at end
   d) underlining of main points
   e) headings in statement form
   f) headings in question form
   g) no organizational aids.

The criterion measures were two equivalent multiple choice tests. Analysis of variance and covariance for all cells proved insignificant. A factorial analysis revealed no differences between any of the organizing aids alone, in combination, or when totally absent. The authors concluded that the aids used in the experiment did not affect comprehension as measured by the multiple choice tests. The use of cued recognition, however, may not be an accurate measure of what the reader remembers or understands.

The Christensen/Stordahl study (1955) typifies many studies of organizational aids and cues to structure. Many are based on pedagogical intuition. It seems reasonable that cues to structure would facilitate recall and comprehension, yet findings have been mixed. As a group the studies are characterized by widely varied criterion measures and lack of training for, or sensitization to, conceptual organizers.

Studies subsequent to Christensen and Stordahl's (1955) can be related to three theoretical views: subsumption theory, a text-processing model and a generative processing model. As the theoretical models are not entirely discrete, studies which most closely,
but not exclusively, reflect each view will be cited as examples.

1. Subsumption Theory and Research

A number of studies in the area of conceptual structuring have arisen from schemata theory and Ausubel's similar theory of subsumption. The subsumption theory suggests that cognitive structure is hierarchically organized in terms of broad inclusive concepts which subsume less inclusive concepts and information (Ausubel, 1960). (That is, the concept of dogs subsumes terriers, poodles and spaniels.) From this organizational principle came the hypothesis that the learning and retention of unfamiliar expository material could be facilitated by advance introduction of appropriate subsuming concepts in the form of "organizers."

Ausubel (1960) presented 120 senior undergraduate students with an expository passage on steel. The passage for the treatment group was prefaced by an organizer designed to present generalized inclusive background information. The control group received the passage prefaced by an historical introduction containing no material which could serve as an ideational framework. The criterion measure was a multiple choice test given immediately after reading.

Although the mean experimental group score was higher than the mean for the control, the results were not statistically significant. These results appeared to be confounded by the fact that some subjects in both groups had prior knowledge of the subject tested. Nonetheless, Ausubel concluded that the subsumers which were introduced provided anchorage for the new concepts presented in the passage.

In another study Ausubel and Fitzgerald (1961) suggested two functions for advance organizers. First, that organizers could act as "ideational scaffolding" with an
optimal level of inclusiveness for subordinate concepts. Second, that they could increase the reader's ability to discriminate between a new passage and what is known and similar.

One hundred and fifty-five subjects were used. Senior undergraduates in the experimental group read a paragraph on Buddhism with advance presentation of a comparative organizer designed to provide "scaffolding" for the main concepts and a generalized overview of the similarities and differences between Buddhism and Christianity. The second treatment provided an expository organizer embodying directly relevant key concepts. The third treatment provided an historical organizer. A control group was presented the comparative organizer only, to determine to what extent the organizer alone could increase comprehension scores beyond the chance level.

The criterion measures were two delayed multiple choice tests. On a three-day basis only the comparative organizer was effective in facilitating retention of the unfamiliar material. The same organizer seemed to work most effectively for those whose initial conceptual background of Christianity was weak. On a ten-day basis the comparative and expository organizer groups scores were significantly higher than the others.

Three important points can be inferred from this study. First, it appears that organizers without passages do not facilitate comprehension. Second, totally unfamiliar material is particularly difficult to retain. Finally, the effects of organizers seem most apparent at delayed testing.

However, the exclusive use of cued tests allows only partial understanding of the effects of organizers on comprehension and recall. The degree to which the text has been internalized by the reader and the degree to which the questions have influenced recall can not be known.
The findings of Proger, Taylor, Mann, Coulson and Bayuk (1970) also suggest that certain types of organizers are more effective than others. Analysis of variance was used for a treatment by sex by ability level design with 124 twelfth-grade students. Students were randomly assigned to one of four advance organizer groups: a) paragraph abstract; b) enumerated sentence outline; c) a true-false pre-test; and d) a completion pre-test. Each of these pre-passage structuring methods employed the same set of ten subsuming points, key to the reading task. After subjects studied the advance organizer and read a detailed passage on Amish customs, they were asked to complete a criterion test of 20 multiple choice items.

No differences were found between organizers on recall of the ten key points. Specific details were facilitated by both the paragraph abstract and the sentence outline (p.<.01). Ability levels also resulted in significant differences (p.<.01). Subjects of low and average ability performed significantly better than subjects of above average ability, again with the paragraph abstract and sentence outline organizers (p.<.05).

The authors felt that the two organizers which did facilitate comprehension may have worked because they produced awareness of the passage structure, or "the giving of answers" may have resulted in superior performance. The latter seems unlikely as it must be remembered that the effect was for details, not the ten key points in the organizer. Also, the use of an immediate, cued criterion measure may have partially obscured effects. As well, because five classes, said to be of different ability levels, were used intact, the apparent effect of ability levels should be interpreted with caution.

Pichert and Anderson's (1977) experiment with college undergraduates was based on schema theory and did not specifically investigate organizers. It did, however, illustrate that an idea's significance in terms of a structure provided before reading determined whether the idea would be learned and subsequently recalled.
Subjects asked to read stories from one of two directed perspectives or no directed perspective were more likely to recall details if they could relate them to a given perspective or structure.

The criterion measures were immediate and delayed written recall. A large number of subjects were lost for delayed recall and significance was noted only for the immediate recall measure.

Although the study was based on narrative material, the findings can be interpreted to mean that alternate conceptual structures used by the reader can provide different frameworks for the internalization and recall of text, possibly by providing categories for information. The structure which the reader imposes on the text may be equally or more important than the structure inherent in the text. The more closely the imposed structure matches the text structure, the more likely the reader's internal representation matches the intent of the text.

2. Text-Processing Theory

Miller (1976) proposed research related to an incomplete text-processing model which was intended to account for the processes involved in comprehending what is read. The model was composed of the following stages: identification of important text elements, construction of internal representations of those elements, and selection and mapping of the appropriate representation.

Similarly, Kintsch and van Dijk's (1978) model of text comprehension and production has as a major component the process of macrostructure formation. The reader, using a general text-schema, is thought to apply rules of deletion, generalization and construction to the text's structure in order to form a mental gist of the main ideas.
or macrostructure. Taking the model a step further, the reader, asked to recall the text, applies rules of addition, particularization and specification to the mental gist, transforming the macrostructure back into a detailed representation of the text.

Holley, Dansereau, Evans, Collins, Brooks and Larson (1981) advanced an argument consistent with the concept of processing the macrostructure and microstructure of text. It was suggested that headings potentially provide useful cues for the input and output of text processing.

They investigated 90 college students' utilization of intact (topic outline) and embedded headings (appropriately positioned in the text) as processing aids with non-narrative text. The results showed both intact or embedded headings to facilitate performance on immediate and delayed free recall measures. The major effect was at delayed recall. Groups whose passages had headings recalled approximately 11% more details at immediate and 44% at delayed recall than groups which read text without headings.

Slater, Graves and Piché (1985) examined the effects of providing subjects with information about the structure of text prior to reading expository passages. A total of two hundred and twenty-four high, middle and low ability ninth-grade students were identified on the basis of the reading comprehension subtest of the California Achievement Test. Subjects were then assigned to one of four pre-reading treatments:

a) description of structure with an outline grid
b) description of structure
c) control condition with note taking
d) control condition without note taking.
Two criterion measures were used—a multiple choice post test and immediate written recall. No differences were found between ability groups. It was found that structural organizers with outline grids reliably facilitated comprehension and recall (p.<.01), whereas organizers without outline grids did not.

These findings can be interpreted as evidence supporting Kintsch and van Dijk's text-processing model (1978), since the outline grids were in effect representative of the macrostructure. It appears that for the ninth-grade subjects in the study, advance sensitization to the macrostructure facilitated the transformation back to microstructure at recall.

Although ability levels showed no effect, it should be noted that cell sizes were relatively small (7 subjects). The use of both cued comprehension and immediate recall give a broader picture of the effect of organizers on readers. It is not clear whether the prior administration of the multiple choice test influenced the subsequent recall scores.

Mayer and Bromage (1980) have reported another investigation of the way in which readers internalize text for recall. One hundred and eight university students in two experiments were given organizers either prior or subsequent to reading technical texts. Subjects in the prior-organizer groups outperformed those in the post-organizer group on immediate recall of encompassing concepts (p.<.01). Thus, it was argued that the locus of effect for conceptual structuring through presentation of an organizer is at encoding.

3. Generative-Processing Theory

Another view of conceptual structuring can be derived from the generative model of learning. Wittrock (1974) suggests that reading comprehension is facilitated when
learners actively construct meaning for text during encoding. When semantic retrieval cues such as paragraph headings are also provided, it is expected that comprehension and recall will be facilitated.

Doctorow, Wittrock and Marks (1978) conducted two experiments with a total of 488 sixth-grade students. Subjects in three treatment groups were instructed to a) read a passage with inserted paragraph headings and to generate a sentence about each paragraph; b) read a passage without headings and generate a sentence about each paragraph; or c) read a passage without inserted headings.

After reading the narrative passage, subjects were tested on two criterion measures: multiple choice and close recall. The combination of generative processing and headings had the greatest significant effect on comprehension (p.<.01). This was followed by instructions to generate sentences, and then insertion of headings (p.<.01).

Another study consistent with the generative-processing model is Alverman's (1982) investigation of the facilitation of written recall. Tenth-grade students, using a generative restructuring organizer wrote the main concepts of the text as they read. Those using the generative organizer showed higher delayed recall than students who did not. The training aspect of Alverman's study is described in the following section. Generative-processing seems to ensure that the reader interacts with the text as he or she reads.

The studies concerned with manipulating the reader's conceptual structure have focused on the use of organizers with older subjects. There have been no studies related to subsumption, text-processing or generative-processing which have examined lower intermediate students.

Studies of conceptual structuring are characterized by varied criterion measures. The use of cued recall in the form of multiple choice has been common. The extent
to which multiple choice tests can uncover the reader's internal representation is unclear. It is likely that written recall more closely illustrates the "shape" of what the reader internalizes. The effect of one criterion measure on a subsequent measure has not been considered by those researchers who used two consecutive measures.

Those organizers which were shown to facilitate recall and comprehension specifically identified the macrostructure or subsuming concepts of a passage. The failure of some organizers to facilitate recall likely arises from lack of training. It does not seem reasonable to conclude that organizers are not effective if subjects have not been trained in their use.

C. Training

A number of educators have recommended training or instruction for skills related to comprehension of expository materials (Estes, 1972; Estes & Vaughan, Jr., 1978; Herber, 1970; Smith, 1964). Although there is no substantial body of research on the effectiveness of reading comprehension instruction, the results of the studies in which training was used are encouraging (Pearson, 1984). The studies reviewed here are those in which training for the use of text structure or conceptual organizers was either used or recommended.

Alverman (1982) investigated the effects of training tenth-grade students to use a graphic representation of text structure including the key points (macropropositions) and some details (micropropositions). A total of thirty average and above average students were divided randomly between the treatment and control conditions.

The graphic organizer group produced greater delayed recall by approximately 10% on details and 25% on main ideas than the control group. Most significant was the
interaction between higher level ideas and the treatment (p<.01).

Although Alverman's (1982) sample was extremely small, the study produced some support for training students to recognize structure. It can not be determined whether the effect resulted from training or whether simple presentation of the organizer would effect the same change.

Baumann's (1984) study of the effectiveness of direct instruction for main idea comprehension also supports the case for training students to recognize and use expository text structure. He divided 66 sixth-grade students, blocked by achievement level, between three experimental groups:

a) a Strategy direct instruction group;
b) a Basal lesson main idea group and
c) a Control group.

After eight sequential lessons in finding main ideas and constructing main idea outlines for social studies texts, the Strategy group outperformed the Basal and Control groups on a measure of ability to recognize implicit and explicit main ideas (macrostructure) (p<.001). No differences were observed in free recall. No interactions between treatment and achievement levels were detected.

Baumann's results indicate that training can improve the reader's awareness of main ideas or macropropositions. The failure to find significant differences on delayed recall may be an effect of when the test was administered. Although an intervening word search or maze was completed to control for short term memory, the recall measure was administered in close temporal proximity to the passage. It may be that a more delayed recall test would identify long-term differences between groups.

Taylor and Beach (1982) also examined the effect of instruction focusing on text structure. Two experiments with fifth-grade students were conducted. In both
experiments the use of an hierarchical summarization strategy based on Kintsch and van Dijk's theory of macrostructure was compared to a more conventional classroom procedure of answering questions after reading. Students in the strategy group were taught to recognize text structure and construct a summary identifying macropropositions and micropropositions as they read.

In the initial experiment 48 subjects were classified as competent (above grade level) or less competent (at or below grade level) on the Gates-MacGinitie Reading Test. Subjects were then blocked by ability level and randomly assigned to either the experimental or conventional groups. Students received either experimental or conventional training once a week for a period of seven weeks.

A short-answer test and recall and organization scores were used as dependent measures. No differences were found between groups on the short answer test (p<.001). Delayed recall and organization scores for the group which received text-structure instruction were significantly higher than those for the conventional instruction group (p<.001).

A second experiment with different subjects, teachers and test passages was conducted to replicate the first. The same instructional materials were used. In this study the conventional group performed significantly better on short answers than the experimental group (p<.001). No differences were observed between treatments on recall scores or organization scores. There was a significant main effect for reading ability (p.<.10).

The authors performed supplemental analyses in an effort to account for the discrepant results between the two experiments. The discrepancies did not appear to be due to differences in reading ability or test passages. An examination of the training protocols revealed that students in the second experimental group had not mastered the
hierarchical summarization strategy as well as those in the first experiment. Thus, it appeared that differences in instructional effectiveness resulted in equivocal findings. It should be noted that some attrition of subjects in the first study may have influenced results.

Taylor and Beach (1984) conducted another similar experiment with 114 seventh-grade students. Students were randomly assigned to one of three conditions:

a) hierarchical summarization for social studies material,
b) conventional instruction (questions following reading of social studies material), and
c) no special instruction.

The groups were reported to be similar in reading ability. Results indicated that the seven weeks of experimental instruction focusing on text structure effectively enhanced performance on measures of written recall and quality of expository writing. Possibly the use of more mature readers accounts for these findings differing from those in the 1982 study.

In a pair of studies directed by Dansereau, the effects of instruction appear to be confounded by other factors. The initial study, cited earlier (Holley, 1981), advanced the hypothesis that both intact and embedded headings provide useful cues for conceptual structuring and recall. It was shown in the one aspect of the 1981 study that headings did significantly facilitate recall for college students. The effect of training for the use of headings was examined in relation to presentation of headings without training. In comparing the training group to the control, both reading text with headings, no differences were found on a dependent free recall measure (p.<1.00). It is possible that exclusive use of immediate recall tests obscured effects. Holley suggested that the length of the training period may have been insufficient to overcome interference from the
subjects' previous strategies.

The second investigation presented two experiments (Brooks, Dansereau, Spurlin & Holley, 1983). Both were concerned with the effects of intact and embedded headings on written recall of college students. As in the first experiment, three dependent measures were used to assess immediate recall of one passage (essay, outline and multiple choice). The same types of measures were used to assess delayed recall of a second passage. It was reported that the presence of headings reliably facilitated delayed test performance (p < .05). This apparently confirms the notion that use of immediate recall does not allow the effects of conceptual structuring to be observed.

The second experiment in the study focused on the effect of instructions with headings. The combination of headings and instructions reliably facilitated performance on all the dependent measures. However, the headings without instruction group failed to outperform the no-headings control group. Failure to sensitize readers to the headings was given as an explanation for the contradictory findings.

Most recently, Stables (1985) conducted a study of the effectiveness of headings without training subjects. Fifty subjects from each of grades five and six were used. Each subject read two passages: one at grade level and one with a grade three readability level (Fry, grade 3.0). Performance on immediate written recall from passages with and without headings was examined. The author examined protocols for the number of superordinate and subordinate ideas recalled, the degree to which the recall matched the author's sequence and the format.

No differences were found between the total number of ideas recalled on passages with or without headings. Headings appeared to have a positive effect on the number of subordinate ideas recalled by poor readers on the passage of low readability (p < .05). Headings had no significant effect on the degree to which students' protocols matched
the author's organizational sequence. There was significantly higher use of section
headings in written recalls for both grades when headings were present in passages
(p < .05).

Parallel studies of students in grades seven through ten indicated that older
students made use of headings on material of low readability. Stables concluded that
students in his study did not have the higher level skills to make use of headings in
writing protocols. He recommended that training be included in further studies.

Aside from training, Stables (1985) seems to have overlooked several points. First,
the research literature indicates that delayed written recall is a more accurate
representation of what the reader has internalized than immediate written recall. The use
of immediate testing may have hidden possible effects.

Second, using the correspondence between order of ideas in the test passage and
ideas in subjects' protocols may not be a valid test of organization. Measuring
organization in this way assumes that the sequence of paragraphs and sequence of ideas
within the paragraphs are the most important aspects of text structure. This may not be
true of descriptive text structure. It seems more important that details or
micropropositions are associated with appropriate main ideas or macropropositions. For
example, the details of one paragraph dealing with a Venus Flytrap were sequenced in
the following way:

Macroproposition: The Venus Flytrap was an endangered species a few
years ago
1. because they were so popular large numbers were dug up
2. became scarce and nearly died out
3. thousands now raised in greenhouses
4. sold around the world as houseplants
5. a very popular plant for young people.

Yet this order could easily be changed without losing meaning:

Macroproposition: The Venus Flytrap was an endangered species a few years ago

3. thousands now raised in greenhouses
1. because they were so popular large numbers were dug up
2. became scarce and nearly died out
5. a very popular plant for young people
4. sold around the world as houseplants

Third, since subjects who read passages with headings used headings in their recalls, it does not seem that students were totally unaffected by their presence. Fourth, the passages designated as "grade level" which were used had actual readability levels above grade level. For example, the fifth-grade passage had a Fry readability of 6.0; the sixth-grade passage had a Fry readability of 7.0.

Finally, the use of unnatural headings, which paraphrased the main idea statement, may have affected results; e.g. — "Beautiful and Interesting Birds" (heading) with "Few birds are as interesting and beautiful as parrots" (main idea statement); "Parrots Like Cages More than Other Birds" (heading) with "Of all the birds kept as pets, parrots seem to like cages the most" (main idea statement).

Relatively few studies have been concerned with training elementary students to recognize or use text structure or cues. Although the effects of organizers seem to be most noticeable at delayed recall, many researchers have used immediate recall as the criterion measure. The ability levels of subjects have either not been considered or were determined differently between studies.
D. Summary

Three lines of research have been discussed: the influence of text structure on the reader; efforts to facilitate internalization of text through organizational aids; and training for comprehension of expository text. The research related to the influence of text structure suggests several points. First, good expository readers are sensitive to and use text structure as an aid to comprehension and recall (Aulls, 1975; Danner, 1976; Robinson & Hall, 1941). Second, not all readers are aware of expository text structure; and it appears that more mature readers have a greater awareness than do younger readers (Carter & Carrier, 1976; Danner, 1976). Third, organized material enables some readers to generate ideas related to the text (Glynn & Di Vesta, 1977). Some readers seem to be able to impose structure on disorganized material (Carter & Carrier, 1976). Finally, the extent to which the text's organization is apparent to the reader determines how much of the content he or she will internalize.

These studies have mainly been conducted with college and university students, using a variety of criterion measures. The readability of materials used has tended to be well below the reading abilities of subjects. Few studies examined differences between subjects of differing abilities.

The research related to facilitating the reader's internalization of text has been characterized by a lack of training. Researchers have apparently expected organizers to influence the reader's conceptual structure, without perceiving a need to instruct subjects in the use of these aids. However, there have been several important findings related to organizers. First, it appears that organizers which do aid the reader specifically identify the main ideas or macrostructure of the text (Ausubel, 1960; Ausubel & Fitzgerald, 1961; Doctorow et al., 1978; Holley et al., 1981; Mayer & Bromage, 1980; Proger et al., 1970).
Second, organizers do not appear to be effective when presented after reading (Mayer & Bromage, 1980). Third, actively generating written statements about what is read also facilitates internalization of text (Alverman, 1980; Doctorow et al., 1978). Only one study has combined the use of generative processing and organizers (Doctorow et al., 1978).

There have been relatively few studies on the effectiveness of instruction for expository comprehension. Some of these have used high school and college students as subjects (Alverman, 1982; Brooks et al., 1983; Holley et al., 1981). There is some evidence that training is effective (Alverman, 1982; Baumann, 1984; Brooks et al., 1983; Taylor & Beach, 1984). Studies with fifth grade students indicate that they are not naturally aware of text structure (Stables, 1985; Taylor & Beach, 1982). Efforts to sensitise fifth grade students to text structure have had mixed results (Taylor & Beach, 1982). None of these studies investigated training for the use of headings. Possibly the use of training for sensitization to headings and text structure is needed to produce different results with younger readers.
CHAPTER III: Method

The purpose of this study was to investigate the effects of training fifth grade students to be sensitive to descriptive text structure and headings as cues to that structure. The content of the expository materials used in the study are representative of the types of topics students are expected to read in content-area textbooks. Data were examined to determine whether there were significant differences in performance between the experimental group and conventional group on either the initial or final test forms.

A. Subjects

Initially 168 fifth grade students from six geographically dispersed parochial schools in the lower mainland of British Columbia (Vancouver, Coquitlam and Burnaby) were involved in the study. Based on information received from principals the schools can be considered representative of low, middle and middle-upper socioeconomic levels. Fifth grade level was selected because: 1) a limited number of studies focusing on advance organizers and text structure have been conducted at the fifth grade level; 2) a limited number of studies utilizing training have been conducted at the fifth grade level and; 3) there seemed to be a need to test assertions by Stables (1985), King (1985) and Gibbs (1985) who concluded that fifth grade students were unable to use headings as aids to recall or organization.
B. School Selection

Schools at each level were roughly paired on the basis of students' ability level and socioeconomic status as estimated by the principals, then randomly assigned to one of the two treatment groups, conventional or experimental. There were two schools of low socioeconomic level; two of mid socioeconomic level; and two of mid-upper socioeconomic level. Each of the six schools had only one non-streamed grade five class.

C. Teachers

The mean number of years of teaching experience for the total of six teachers whose students were involved in the study was 6.6, ranging from 1 to 10 years. The mean number of years of experience for the conventional group teachers was 6.3 with 4, 6 and 9 years of experience respectively. The mean number of years of experience for the teachers of the experimental group was 7.0, with 1, 10 and 10 years of experience respectively. The investigator, responsible for the experimental instruction, had 3 years of previous experience.

D. Materials

The materials used in the study included manuals of procedure, instructional packages and testing instruments.
1. Manuals of Procedure

All teachers of the conventional group were provided with a manual of procedures for the study. The manual contained: 1) a calendar; 2) contact numbers; 3) administration procedures for the Gates-MacGinitie Comprehension Subtest; 4) standardized test procedures for initial and final testing; 5) the initial test (*Termites*) with questions; 6) standardized instructional procedures for daily lessons; 7) seven instructional passages with questions; 8) the final test passage (*Parrots*); and 9) a section for comments. Standardized test and instructional procedures are included in Appendix A; instructional materials are in Appendix B.

The teachers of the experimental group were also provided with a manual of procedures for the study. The manual contained: 1) a calendar; 2) contact numbers; 3) administration procedures for the Gates-MacGinitie Comprehension Subtest; 4) standardized test procedures for initial and final testing (Appendix A); and 5) a section for comments.

2. Instructional Materials

The instructional selections were specifically designed for the study. These selections, used by both treatments in the study, were constructed using relatively unfamiliar content with topics of the type commonly found in elementary content textbooks.

The seven passages which were constructed had a mean Fry readability level of 3.4. The title of each passage, Fry readability estimate, number of headings and topics are found in Table 1. Sources used in constructing passages are listed in Appendix E.
The seven instructional passages were written in descriptive (information-classification) style. The series of passages was designed to increase gradually in length, number of headings and concept load. Each passage was written below grade level to reduce the possibility of students being unable to read the connected prose.

a) Materials used with Conventional Group.

The instructional materials used with the conventional group included a set of questions that focused on the macrostructure of each passage. The first set of questions was based on the initial test passage. The questions used by the conventional group are found in Appendix B. An overview of materials introduced in instructional sessions and the focus of instruction for both conventional and experimental groups is found in Table 2.

b) Materials used with Experimental Group.

The instructional materials used with the experimental group included two cut-up outlines; one ideas sorting worksheet and eight idea sorting envelopes; two instructional passages with matching cut-up outlines; one instructional passage with scrambled outline worksheet; three instructional passages with blank side-bars. (See Table 2 and Appendix C.)

E. Instruments

Three instruments were used in the study: one standardized (Gates–MacGinitie, Comprehension Subtest, Level D, Form 2) and two non-standardized tests; the latter two designed to measure Quantity and Organization of Written Recall (initial test, Termites;
Table 1: Titles, Number of Headings, Readability Levels and Topics of Instructional Passages Used in Study

<table>
<thead>
<tr>
<th>Title</th>
<th>Headings</th>
<th>Fry Readability Estimate</th>
<th>General Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grasshoppers</td>
<td>3</td>
<td>3.8</td>
<td>Behaviour and physical features of the grasshopper.</td>
</tr>
<tr>
<td>Riches of the Sea</td>
<td>3</td>
<td>3.9</td>
<td>Predicts scientific developments in underwater farming and mining.</td>
</tr>
<tr>
<td>Fire Walkers</td>
<td>4</td>
<td>3.7</td>
<td>Describes what is known about the practice of walking through fire, including how and why it is done.</td>
</tr>
<tr>
<td>The Vikings of Denmark</td>
<td>4</td>
<td>3.9</td>
<td>Explains why the Vikings left Denmark; describes sailing vessels; raids; and conversion to Christianity.</td>
</tr>
<tr>
<td>Animal Protection</td>
<td>5</td>
<td>3.5</td>
<td>Describes five ways in which animals protect themselves: using speed, teeth, claws, colour or poison.</td>
</tr>
<tr>
<td>Horses</td>
<td>5</td>
<td>2.2</td>
<td>Briefly describes prehistoric horses and traces development to modern appearance and uses.</td>
</tr>
<tr>
<td>Animals' Eyes</td>
<td>5</td>
<td>3.0</td>
<td>Explains that different visual information is required by different animals. Describes the ways in which rabbits, lizards, owls and toads use their unique eyes.</td>
</tr>
</tbody>
</table>
Table 2: Overview of Materials Introduced in Each of Ten Instructional Sessions for Both Conventional and Experimental Groups

<table>
<thead>
<tr>
<th>Session</th>
<th>Conventional</th>
<th>Experimental</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td><em>Termites</em> passage (from initial testing) and questions</td>
<td>Cut up outlines of <em>Goldilocks</em> and <em>Grasshoppers</em>.</td>
</tr>
<tr>
<td>Two</td>
<td><em>Grasshoppers</em> passage and questions</td>
<td>idea sorting worksheet; cut-up idea sorting packages.</td>
</tr>
<tr>
<td>Three</td>
<td><em>Riches of the Sea</em> passage with questions</td>
<td><em>Riches of the Sea</em> passage with matching cut-up outline.</td>
</tr>
<tr>
<td>Four</td>
<td><em>Vikings of Denmark</em> passage with questions</td>
<td><em>Vikings of Denmark</em> passage with matching cut-up outline.</td>
</tr>
<tr>
<td>Five</td>
<td><em>Fire Walkers</em> passage with questions</td>
<td><em>Fire Walkers</em> passage with scrambled outline (worksheet).</td>
</tr>
<tr>
<td>Six</td>
<td><em>Animal Protection</em> passage; worksheet with questions</td>
<td><em>Animal Protection</em> passage with side-bar for headings and details.</td>
</tr>
<tr>
<td>Seven</td>
<td><em>Horses</em> passage with questions</td>
<td><em>Horses</em> passage with side-bar for headings and details.</td>
</tr>
<tr>
<td>Eight</td>
<td><em>Animals' Eyes</em> passage with questions</td>
<td><em>Animals' Eyes</em> passage with side-bar for headings.</td>
</tr>
<tr>
<td>Ten</td>
<td><em>Animals' Eyes</em> questions for marking</td>
<td>Sample protocols.</td>
</tr>
</tbody>
</table>

final test, *Parrots.*
1. Standardized Measure

The Comprehension subtest of the Gates-MacGinitie Reading Test Level D Form 2 (Canadian Edition, 1979-80) was administered so that it could be used as a covariable with the non-standardized measures. As well it was to be used to classify students according to low, average and high reading ability in order to test the hypotheses dealing with ability level. Students with grade equivalent scores of 3.0 to 4.9 were to be classified as low; 5.0-5.9 were to be classified as average; and 6.0 or higher were to be classified as high in ability. The test was chosen for the following reasons.

a) **Content:** Test items were developed to have an "international character." Consultants from minority groups eliminated items with apparent bias. Passages are written by a number of international authors including Canadians. Content of items was chosen to be within the experience of most students from diverse backgrounds. Sixty percent of the comprehension subject matter is comprised of content material (social sciences 27.5%; natural sciences 27.5%; the arts 5%). Narrative material comprises the remaining forty percent. Fifty-five percent of the test questions are literal; forty-five percent are inferential. The relatively high number of content area items was deemed appropriate for the purposes of the study.

b) **Standardization:** Canadian norms were based on a total sample of 46,000 students. The sample was drawn so that each province, urban and non-urban settings, private and public schools, were proportionally represented. Between 3,000 and 4,500 students of each grade level were tested. The norming group was chosen to be representative, at each grade level, of English-speaking students in Canada. It was
reasoned that the inclusion of separate schools in the norming sample made the test appropriate for the sample used in the present study.

c) **Validity:** The test was constructed to assure validity for most school reading programs. All items were examined by a panel of Canadian educators. Items were discarded or modified on the basis of their recommendations. Content of the passages was chosen according to a plan specifying the proportion of natural science, social science, arts and narrative materials. After a tryout, items of appropriate difficulty and content were selected from a larger pool of items.
The standard time allotment for this subtest allows all but the slowest students to attempt each item. (In the present sample, all students to whom the test was administered were able to finish within the time allotment.)

d) **Reliability:** Kuder–Richardson Formula 20 reliability coefficients for comprehension on the Canadian Edition, Level D, range from .87 to .89. These were considered to be acceptable levels of reliability.

e) **Use in similar studies:** The test was used similarly in related studies (Taylor, 1984; Stables, 1985).

2. **Non–Standardized Measures**

The initial and final measures of Quantity and Organization of ideas in written recall were based on a passage used by Stables (1985). The passage, *Parrots*, reported by Stables to have a Fry readability estimate of 3.0, seemed a logical instrument with
which to examine the questions of the study. Because Stables found that fifth grade students were apparently unable to use headings it was reasoned that the question of whether these findings resulted from lack of developmental readiness or lack of training and sensitization would best be tested on the same basic material.

a) Initial Test.

The initial test, *Termites*, was written to parallel the construction of the *Parrots* passage on the bases of format; number of headings; number of paragraphs; number of macro and micro propositions; similarity of topics and concept load; and readability. Each passage is written in information/classification style; is one page in length; consists of five paragraphs with headings; has five macropropositions and 26 micropropositions. There are an equal number of cases within each passage where the content of propositions can be segmented for partial marks. (These are more fully outlined in Scoring Procedures, Appendix D)

b) Final Test.

The final test, *Parrots*, based on the passage written by Crowhurst (1984) was reported by Stables (1985) to have a Fry readability estimate of 3.0. The text of the passage was not modified, but the headings used by Stables were revised to resemble those found in natural expository text. Original and revised headings are listed in Table 3.

Four common readability formulae were applied to both passages. Each of the formulae provided estimates of the readability level. These are found in Table 4.

According to the Dale–Chall formula, the two passages, *Termites* and *Parrots* have an equal number of difficult words, that is, words not appearing on the DALE LIST OF
### Table 3: Original and Revised Headings for Final Test Passage (*Parrots*)

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Beautiful and Interesting Birds</td>
<td>The Parrot Family</td>
</tr>
<tr>
<td>How Parrots are Different</td>
<td>Different Features</td>
</tr>
<tr>
<td>Parrots Live Where it is Warm</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>Parrots Like Cages More Than Other Birds</td>
<td>A Parrot’s Cage</td>
</tr>
<tr>
<td>Parrots Eat Nearly Anything</td>
<td>Feeding A Parrot</td>
</tr>
</tbody>
</table>

### Table 4: Estimated Readability Levels for Non-Standardized Measures (Initial and Final Test Passages) Using Four Readability Formulae

<table>
<thead>
<tr>
<th>Test</th>
<th>Readability Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FRY</td>
</tr>
<tr>
<td>Initial (<em>Termites</em>)</td>
<td>3.0</td>
</tr>
<tr>
<td>Final (<em>Parrots</em>)</td>
<td>3.3</td>
</tr>
</tbody>
</table>
3000 FAMILIAR WORDS. Words not found on the DALE LIST are shown in Table 5.

Table 5: Unfamiliar Words in Initial and Final Test Passages According to the Dale-Chall List of 3000 Familiar Words

<table>
<thead>
<tr>
<th>Termites</th>
<th>Parrots</th>
</tr>
</thead>
<tbody>
<tr>
<td>appearance</td>
<td>admired</td>
</tr>
<tr>
<td>damage</td>
<td>beak</td>
</tr>
<tr>
<td>environment</td>
<td>beautiful</td>
</tr>
<tr>
<td>extremely</td>
<td>easily</td>
</tr>
<tr>
<td>insects</td>
<td>greatest</td>
</tr>
<tr>
<td>similar</td>
<td>interesting</td>
</tr>
<tr>
<td>soldiers</td>
<td>liquid</td>
</tr>
<tr>
<td>termites</td>
<td>parrots</td>
</tr>
<tr>
<td>tropics</td>
<td>vitamins</td>
</tr>
<tr>
<td>underground</td>
<td>warmer</td>
</tr>
</tbody>
</table>

F. Procedures

The actual study was conducted in five brief stages. Following the pilot study, procedures were established for teacher orientation and student familiarization, testing, initial testing, instructional sessions and final testing.

1. Pilot

A two-part pilot study was conducted for the purpose of determining whether students reading below grade level would be able to complete the initial and final tests of organization and quantity (Termites and Parrots). The wording of the passage was to be checked; testing instructions and scoring procedures were to be tested and refined.

In the first part of the pilot one intact, non-streamed fifth grade class in a lower socioeconomic parochial school was used. Over a four-day period the Termites
and *Parrots* tests were administered as tests of delayed recall. The original time allotment for studying was adjusted from 20 to 15 minutes and scoring procedures were refined. As well readability estimates were re-checked when it appeared that the *Termites* passage was not as difficult as *Parrots*. As a result, *Termites* was modified slightly to give a higher readability estimate.

In the second part of the pilot six fourth grade students from a public school in a similar socioeconomic area were administered the test passages as an oral reading test and asked to answer literal comprehension questions. Of the six students two were identified as reading below grade level; two as reading at grade level; and two as reading above grade level. Reading levels were estimated by the teacher based on testing and classroom performance. Because of difficulties experienced by these children the words *existed* and *unusual* were taken out of the *Termites* passage.

2. **Main Study**

   a) **Teacher Orientation.**

   The investigator held two teacher orientation sessions with each of the teachers. In the first session each teacher was presented with a general overview of the study. In the second session the teacher was provided with a manual describing the testing and instruction procedures. For the conventional teachers emphasis was placed on how to use the testing and instructional materials and the calendar was carefully reviewed. For the experimental teachers emphasis was placed on how to use the testing materials; following the calendar of testing; and the importance of not discussing the experimental lessons. During this stage the investigator spent one half-day in each of the experimental classrooms to establish a rapport with students prior to the actual treatment.
b) Administration of Standardized Measure.

The second stage involved administration of the Comprehension subtest of the Gates-MacGinitie Reading Test to all subjects in the study. The tests were administered by the classroom teachers and scored by the investigator.

c) Administration of Initial Test.

The third stage involved administration of the initial test for quantity and organization of ideas in delayed written recall (Termites). This was accomplished over two days, with the classroom teachers using standardized instructions (Appendix A). On the first day students were directed to study the one page passage for 15 minutes, using whatever would help them to remember it for the following day. On the second day teachers directed students to write down everything they recalled in a protocol booklet, allowing 25 minutes. Protocols were collected by the investigator and scored on separate templates. No scores were reported to students or teachers.

d) Instructional Sessions: Experimental.

The fourth stage consisted of 10 instructional sessions. Subjects in the experimental group were instructed by the investigator for all but the ninth session which was a practice test session supervised by the classroom teacher.

Experimental instruction was conducted by the investigator for several reasons. The range of teaching experience (1–10 years) within the experimental group was considerable and it was hoped that the teacher variable could be minimized across this treatment. The investigator spent one half day with each of the experimental classes prior to the study to develop rapport with the students. Having classroom teachers in this group conduct the experimental instruction would have presented several problems: 1) a lengthy period of inservice would have been necessary; 2) given the time of year teachers may have been reluctant to commit sufficient time or energy to mastering the
procedures; 3) the time required to familiarize teachers with procedures would have been considerably greater for the experimental than the conventional group; 4) there was no way of ensuring that teachers would not give more emphasis to text structure and headings in their own lessons once they were sensitized to the focus of instruction. The investigator, familiar with the experimental procedures, was able to provide the strongest, most consistent form of the treatment. The first seven sessions were each one hour long; the final three were each approximately one half hour in length. Experimental instruction in the first two sessions involved identifying the differences between narrative and information material and developed the concept of classification using cut-up outlines of the word and phrase level. Headings were chosen to be used as cues to text structure because they occur naturally in text and have proven effective as organizers with sensitized readers (Dansereau et al., 1983; Holley et al., 1981) In the third session students were introduced to a content passage with three headings and sorted a corresponding cut-up outline. The same basic procedure was used in session four with a content passage containing four headings. A similar passage was used in session five, but without a cut-up outline. Instead, students were instructed to sort a scrambled outline with alternate headings on an accompanying sheet.

During session six, students were instructed to read a passage with five headings and construct an outline in the side-bar, identifying main idea. Session seven involved the same basic procedure although students were now encouraged to generate alternate headings and construct an outline without reference to the passage if they were able. Session eight involved a discussion of study strategies and a timed study practice for a passage with five headings. Session nine, in which students practised writing delayed recall was supervised by the teacher using the standard instructions. Instruction in the tenth session was focused on review of study strategies and example protocols were
examined. Throughout the experimental sessions the content of material from the previous lesson was recalled by students prior to new instruction. In addition, the structure of the content material and the relation between propositions and headings were emphasized in all but the practice writing session. Instruction throughout the experimental lessons was based on techniques described by Catterson (1983) and Pieronek (1984).

e) Instructional Sessions: Conventional.

In contrast, the conventional instruction involved no emphasis on structure. The 10 conventional sessions generally followed a basic pattern. Students read the content passages independently and wrote answers to related questions which were based on the macrostructure. Throughout the conventional sessions content of passages from the previous session was reviewed by having students share answers orally, mark and correct. Materials were collected by the investigator on four occasions and examined to ensure that exercises were completed thoroughly.

f) Administration of Final Test.

Administration of the final test (Parrots) comprised the final stage of data collection. As with the initial test, administration was accomplished by the classroom teachers over two days. The passage was studied on the first day; recalled on the second. Protocols were then collected by the investigator for scoring and analysis.

Table 6 provides a summary of the entire procedure.

G. Scoring

Recall templates were developed based on the template used by Stables (1985) with the addition of heading bars. Scoring procedures for Quantity and Organization were developed by Goble and Coulombe (1986) adapting procedures used by Taylor (1982), Clark (1982) and Stables (1985). Table 7 shows a summary of procedures used
Table 6: Summary of Procedures Used for Conventional and Experimental Groups

<table>
<thead>
<tr>
<th>Session</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conventional</td>
</tr>
<tr>
<td>Teacher Orientation/Student Familiarization</td>
<td>Met individually with each teacher to provide overview; describe role.</td>
</tr>
<tr>
<td></td>
<td>Provided calendar of procedures and manual of procedures. Teachers told how to monitor instruction.</td>
</tr>
<tr>
<td>Initial testing (Termites) Sessions</td>
<td>1. Each teacher administered standardized study portion of initial test (Termites). Fifteen minutes. 2. Each teacher administered delayed written recall of initial test, using standardized instructions.</td>
</tr>
<tr>
<td>Instructional Sessions: Lesson One</td>
<td>Teachers directed students to give written answers to questions based on Termites.</td>
</tr>
<tr>
<td>Lesson Two</td>
<td>Teachers led oral sharing, marking and correcting of Termites questions; directed students to read Grasshoppers and give written answers to questions.</td>
</tr>
<tr>
<td>Lesson Three</td>
<td>Teachers led oral sharing, marking and correcting of <em>Grasshoppers</em> questions; directed students to read <em>Riches of the Sea</em> and give written answers to questions.</td>
</tr>
<tr>
<td>Lesson Four</td>
<td>Teacher led oral sharing, marking and correcting of <em>Riches of the Sea</em> questions; directed students to read <em>The Vikings of Denmark</em> and give written answers to questions.</td>
</tr>
<tr>
<td>Lesson Five</td>
<td>Teacher led oral sharing, marking and correcting of <em>The Vikings of Denmark</em> questions; directed students to read <em>Fire Walkers</em> and give written answers to questions.</td>
</tr>
<tr>
<td>Lesson Six</td>
<td>Teacher led oral sharing, marking and correcting of <em>Fire Walkers</em> questions; directed students to read <em>Animals' Protection</em> and give written answers to questions.</td>
</tr>
<tr>
<td>Lesson Seven</td>
<td>Teacher led oral sharing, marking and correcting of <em>Animal Protection</em> questions; directed students to read <em>Horses</em> and give written answers to questions.</td>
</tr>
<tr>
<td>Lesson Eight</td>
<td>Teacher led oral sharing, marking and correcting of <em>Horses</em> questions; directed students to study and answer questions on <em>Animals' Eyes</em>.</td>
</tr>
</tbody>
</table>
Practice Session

Teachers supervised as students practised writing a delayed recall protocol to gain experience prior to actual testing. (*Animals' Eyes* using standard instructions).

Lesson Nine

Teacher led oral sharing, marking and correcting of *Animals' Eyes* questions. Investigator directed examination of two practice protocols; led discussion regarding organization.

Final Testing Sessions

1. Each teacher administered standardized study portion of final test (*Parrots*). Fifteen minutes.

2. Each teacher administered delayed written recall of final test, using standardized instructions.

Experimental lessons and materials are contained in Appendix C. Conventional questions are contained in Appendix B. Initial and Final test passages and directions are contained in Appendix A.

in developing scoring procedures for Quantity. Table 8 shows a summary of procedures used in developing scoring procedures for Organization. Scoring procedures, tests, templates and examples from the study are included in Appendix D.

Written recall scores for quantity and organization were recorded on the templates rather than student protocols. Scores were later transferred to master data sheets on which identity number, school, ability level and standard test scores had been recorded. Data were then entered on computer and analyzed.

H. Design and Data Analysis

Two measures were taken to reduce the threat to internal validity which would have been posed by a strict posttest-only non-equivalent control group design. Because the threat to internal validity in such a design is the possibility of preexisting group
Table 7: Summary of Scoring Procedures Used in Developing Goble/Coulombe (1986) Scoring Procedures for Quantity of Ideas in Written Recall

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>used with expository</td>
<td>used with narrative</td>
<td>used with expository</td>
<td>used with expository</td>
</tr>
<tr>
<td>scored against template of propositions</td>
<td>scored against template of pausal units</td>
<td>scored against template of pausal units representing macropropositions (superordinate) and micropropositions (subordinate)</td>
<td>pausal units representing macropropositions and micropropositions</td>
</tr>
<tr>
<td>one score per proposition</td>
<td>partial or single score per pausal unit</td>
<td>separate scores for macro- and micropropositions</td>
<td>partial or single score per pausal unit</td>
</tr>
<tr>
<td>expressed as total percent</td>
<td>expressed as subtotals</td>
<td>expressed as subtotals</td>
<td>expressed as total</td>
</tr>
</tbody>
</table>

differences (Borg & Gall, 1983). The Gates–MacGinitie Comprehension Test was used as a covariate and analysis of covariance was employed to determine whether the groups differed significantly on the two initial dependent measures (quantity or organization of ideas in delayed written recall). Thus, the design of the study was a pretest–posttest non-equivalent control group design.

The following considerations should be noted with respect to satisfying the assumptions underlying analysis of covariance (homogeneity of variance, representativeness of the sample, and normality of measures within the population). Homogeneity of variance was found for each measure using the test statistic F (Hopkins & Glass, 1984, p. 262). Although the sample was not randomly selected it can be considered reasonably
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>used with expository</td>
<td>used with narrative</td>
<td>used with expository</td>
<td>used with expository</td>
</tr>
<tr>
<td><strong>organization</strong> assessed on basis of number of <strong>subsections</strong> with information recalled in order</td>
<td><strong>sequence evaluation</strong> subjectively estimated on basis of observed match between author and student or computed as correlation</td>
<td><strong>organization</strong> assessed on basis of agreement between author's and student's sequence</td>
<td><strong>organization</strong> assessed on combined aspects of <strong>sequence evaluation</strong> by <strong>subsection</strong> (clusters), <strong>format</strong> features (headings), and weighted scores for <strong>importance level</strong></td>
</tr>
<tr>
<td>expressed as rating (1–5)</td>
<td>expressed as rating (excellent, good, fair, poor) or Kendall's tau</td>
<td>expressed as total out of 5</td>
<td>expressed as total out of 61</td>
</tr>
<tr>
<td><strong>importance level</strong> given using weighted score for importance of each pausal unit</td>
<td><strong>format</strong> identified using six features: title, headings, grouping, point form, numbering, paragraphs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>expressed as mean number of students using each feature.</td>
</tr>
</tbody>
</table>
representative of the academic abilities of fifth grade students in Canada when compared to local and national norms. As well, research has suggested that the dependent recall variables, quantity and organization, are normally distributed (Danner, 1976; Meyer, 1984; Meyer, Brandt & Bluth, 1980; Taylor, 1982).

Since the study was concerned with differences which might exist subsequent to treatment the hypotheses were stated in reference to the final testing. Three hypotheses were stated with each dependent variable. Analysis of covariance, using comprehension scores on the Gates–MacGinitie Reading Test, was employed to test each set of hypotheses. The level of statistical significance for testing differences was set at $\alpha < .05$. The data were analyzed using the Statistical Package for Social Sciences (SPSS), University of British Columbia.
CHAPTER IV: Results

This chapter will present results in five categories. First, results of the standardized comprehension subtest of the Gates-MacGinitie reading test will be described. Second, reliability measures for scoring will be presented. Next, comparison between groups on the initial measures of Quantity and Organization of ideas in delayed written recall will be reported. Fourth, the six research hypotheses will be restated followed by presentation of the relevant results. Finally, a post hoc examination of the use of headings by treatment groups on initial and final testing will be presented.

A. Gates-MacGinitie

Scores from the Gates-MacGinitie comprehension subtest were used in two ways. First, the scores were used as a covariate because it was not initially known whether the treatment groups were comparable in ability. Second, the scores were used to classify students according to low, average or high reading ability. The original basis for determining ability levels (grade equivalents from 3.0 to 4.9 for low, from 5.0 to 5.9 for average and 6.0 and above for high) proved to be unrealistic. Actual scores on the Comprehension subtest ranged from a grade equivalent of 2.0 to 11.6 with the preponderance of scores in the 5.2 to 8.2 range. It was decided to classify students scoring below minus one standard deviation as low; between plus and minus one standard deviation as average; and above plus one standard deviation as high. These classifications compared favourably with teachers' estimates of ability based on previous testing and classroom performance. Table 11 provides a summary of range, means, standard deviations and comprehension scores for all subjects used in the analyses. Due to
absenteeism and lack of previously collected standardized scores for some subjects data were collected from 153 of the 168 possible subjects. Of the fifteen students for which data were not obtained nine were from the experimental group; six were from the conventional group. Of the nine students eliminated from the experimental group six were absent for one of the testing sessions, one scored below the norms on the Gates–MacGinitie comprehension subtest; and two were absent for the duration of the study. The six students excluded from the conventional group were absent for one of the testing sessions. The experimental group had 75 students and the conventional group had 78 students. The mean number of instructional sessions attended by the total sample of 163 was high, as were the means for attendance within the treatment groups. Actual means are listed in Table 9.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean attendance</th>
<th>Mean attendance (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional</td>
<td>78</td>
<td>9.76</td>
<td>97.6%</td>
</tr>
<tr>
<td>Experimental</td>
<td>75</td>
<td>9.72</td>
<td>97.2%</td>
</tr>
<tr>
<td>Total sample</td>
<td>153</td>
<td>9.74</td>
<td>97.4%</td>
</tr>
</tbody>
</table>

On the basis of scores obtained from the Gates MacGinitie Comprehension Subtest, Canadian Edition, Form D (1979–80) administered by teachers just prior to the study, the conventional and experimental groups were seen to be similar in ability. The T-values for scores on the Gates–MacGinitie are listed in Table 10.
Table 10: Means and Standard Deviations of Conventional, Experimental, West Vancouver (1982) and Stables (1985) Groups for Gates–MacGinitie Reading Test, Comprehension Subtest (T-scores)

<table>
<thead>
<tr>
<th>Group</th>
<th>X</th>
<th>S.D.</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional</td>
<td>52.57</td>
<td>8.76</td>
<td>78</td>
</tr>
<tr>
<td>Experimental</td>
<td>52.12</td>
<td>9.23</td>
<td>75</td>
</tr>
<tr>
<td>Combined Conventional/Experimental</td>
<td>52.35</td>
<td>9.23</td>
<td>153</td>
</tr>
<tr>
<td>West Vancouver (1982)</td>
<td>53.38</td>
<td>7.90</td>
<td>313</td>
</tr>
<tr>
<td>Stables (1985)</td>
<td>53.22</td>
<td>9.83</td>
<td>50</td>
</tr>
</tbody>
</table>

The means and standard deviations for the conventional and experimental groups are comparable: $X = 52.57$, s.d. = 8.76 and $X = 52.12$, s.d. = 9.23 respectively. The mean Comprehension score for fifth grade students in the Stables (1985) study are also included in Table 10. The subjects in the Stables sample were randomly selected from a total of three intact, regular, non-streamed fifth grade classes in Maple Ridge, Richmond and Surrey, British Columbia. It can be seen from Table 10 that the mean and variance in academic ability for subjects in the present study were comparable to those of: 1) subjects randomly selected from lower mainland public schools in the Stables study; and 2) the 1982 West Vancouver fifth grade population.
Table 11: Summary of Means, Standard Deviations and Range for Gates–MacGinitie Comprehension Scores

<table>
<thead>
<tr>
<th></th>
<th>T-Scores</th>
<th></th>
<th>Grade Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group</td>
<td>X</td>
<td>s.d.</td>
</tr>
<tr>
<td>Conventional</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>40.85</td>
<td>4.42</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>52.67</td>
<td>3.08</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>62.61</td>
<td>2.99</td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>40.70</td>
<td>5.37</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>53.09</td>
<td>3.46</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>64.26</td>
<td>3.26</td>
</tr>
</tbody>
</table>

Note: The table above provides a summary of the means, standard deviations, and ranges for T-Scores and Grade Equivalents for conventional and experimental groups, differentiated by low, average, and high levels of comprehension.
B. Reliability for Scoring

All scoring was done by the investigator. One hundred and forty-seven protocols were scored for the initial test. One hundred and fifty-three protocols were scored for final test. Twenty-five percent of the final protocols were than randomly selected. To determine reliability these were re-marked by an investigator from a parallel study using a blind scoring procedure. Interrater reliability was .99 for the Quantity measure and .99 for the Organization measure. An additional twenty-five percent of the protocols were randomly selected and rescored blindly by the investigator to establish intrarater reliability. Intrarater reliability was .99 for Quantity and .99 for Organization. Both reliability measures were computed using a covariance matrix on the Statistical Package for the Social Sciences (SPSS) at the University of British Columbia.

The high level of interrater reliability may have stemmed from the fact that the raters (Goble/Coulombe) had developed the scoring procedures so it was decided to test interrater reliability using a rater who was unfamiliar with the study. An additional 10% of the protocols were rescored blindly and interrater reliability was computed at .99 for both measures.

C. Initial Tests

The initial test scores for Quantity and Organization were examined using analysis of covariance with the Gates–MacGinitie Comprehension subtest to determine whether significant differences existed between groups prior to treatment. The means, standard deviations and analysis of covariance for both initial measures are summarized in Table 12. No significant differences existed between groups on initial measures of Quantity or
Table 12: Summary of Means, Standard Deviations and Analysis of Covariance for Initial Scores With Gates-MacGinitie Comprehension Scores

<table>
<thead>
<tr>
<th>Quantity*</th>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Conv)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>X = 16.96</td>
<td>1</td>
<td>28.41</td>
<td>1.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sd = 5.93</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Exp)</td>
<td>X = 15.87</td>
<td>1</td>
<td>28.41</td>
<td>1.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sd = 6.89</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>3819.08</td>
<td>140</td>
<td>27.28</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organization**</th>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Conv)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>X = 22.66</td>
<td>1</td>
<td>5.64</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sd = 11.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Exp)</td>
<td>X = 22.73</td>
<td>1</td>
<td>5.64</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sd = 12.94</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>15031.19</td>
<td>140</td>
<td>107.36</td>
<td></td>
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</tbody>
</table>

* Possible score of 31 points  **Possible score of 61 points
Table 13: Summary of Means, Standard Deviations, and Analysis of Covariance for Final Scores by Treatment and Ability with Gates-MacGinitie Comprehension

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>(Conv)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>485.97</td>
<td>1</td>
<td>485.97</td>
<td>14.729*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>X = 13.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>sd = 6.31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Exp)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>X = 17.09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>sd = 7.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability</td>
<td></td>
<td>46.67</td>
<td>2</td>
<td>23.34</td>
<td>0.71</td>
</tr>
<tr>
<td>Treatment x Ability</td>
<td></td>
<td>32.86</td>
<td>2</td>
<td>16.43</td>
<td>0.50</td>
</tr>
<tr>
<td>Residual</td>
<td></td>
<td>4817.07</td>
<td>146</td>
<td>32.99</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organization</th>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
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</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>(Conv)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6757.65</td>
<td>1</td>
<td>6757.65</td>
<td>58.82*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>X = 21.65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>sd = 10.86</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Exp.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>X = 34.76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>sd = 14.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>n = 75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability</td>
<td></td>
<td>118/09</td>
<td>2</td>
<td>59.05</td>
<td>0.51</td>
</tr>
<tr>
<td>Treatment x Ability</td>
<td></td>
<td>34.59</td>
<td>2</td>
<td>17.29</td>
<td>0.51</td>
</tr>
<tr>
<td>Residual</td>
<td></td>
<td>16774.51</td>
<td>146</td>
<td>114.89</td>
<td></td>
</tr>
</tbody>
</table>

* p < .001
D. Final Tests

Three null hypotheses were formulated in relation to each of the final measures, Quantity and Organization. This section will present the hypotheses and results pertaining to the measure of Quantity followed by those pertaining to Organization. The means, standard deviations, and analysis of covariance for both measures are summarized in Table 13.

1. Quantity

Ho₁: There will be no significant difference between the treatment groups in their adjusted mean posttest performance on the quantity of ideas in delayed written recall.

A significant difference, in favour of the experimental group was found between treatments on the measure of Quantity (F = 14.729, p<.001). The null hypothesis was rejected. The effect size for this difference was .54.

Ho₂: There will be no significant difference between the three reading ability groups in their adjusted mean posttest performance on the quantity of ideas in delayed written recall.

No significant effect was found for ability group (F = 0.71). The null hypothesis was accepted.

Ho₃: There will be no significant interaction between student membership in both independent variable populations (treatment, ability) and their adjusted mean posttest scores for quantity of ideas in delayed written recall.

No significant interaction was found between treatment and ability group (F = 0.50). The null hypothesis was accepted.
2. Organization

H05: There will be no significant difference between the treatment groups in their adjusted mean posttest performance on the organization of ideas in delayed written recall.

A significant difference, in favour of the experimental group, was found between treatments on the measure of Organization (F = 58.82, p < .001). The null hypothesis was rejected. The effect size for this difference was .94.

H05: There will be no significant difference between the three reading ability groups in their adjusted mean posttest performance on the organization of ideas in delayed written recall.

No significant effect was found for ability group (F = 0.51). The null hypothesis was accepted.

H06: There will be no significant interaction between student membership in both independent variable populations (treatment, ability) and their adjusted mean posttest scores for quantity of ideas in delayed written recall.

No significant interaction was found between treatment and ability group (F = 0.51). The null hypothesis was accepted.

E. Post Hoc Examination of Headings

Subsequent to examining the measures of Quantity and Organization it was decided to determine whether the treatment groups differed significantly on the use of headings for initial or final testing. Table 14 provides a summary of means, standard deviations and analysis of covariance for Headings.
Table 14: Summary of Means and Analysis of Covariance for Headings by Treatment and Ability with Gates-MacGinitie Comprehension

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Test Headings (possible score of 5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>2.32</td>
<td>1</td>
<td>2.32</td>
<td>0.72</td>
</tr>
<tr>
<td>(Conv)</td>
<td>$\bar{X} = 0.39$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$sd = 1.15$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Exp)</td>
<td>$\bar{X} = 0.64$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$sd = 1.21$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability</td>
<td>1.38</td>
<td>2</td>
<td>0.69</td>
<td>0.38</td>
</tr>
<tr>
<td>Treatment x Ability</td>
<td>3.98</td>
<td>2</td>
<td>1.99</td>
<td>1.10</td>
</tr>
<tr>
<td>Residual</td>
<td>252.57</td>
<td>140</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Final Test Headings (possible score of 5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>538.27</td>
<td>1</td>
<td>538.27</td>
<td>368.78*</td>
</tr>
<tr>
<td>(Conv)</td>
<td>$\bar{X} = 0.37$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$sd = 1.15$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Exp)</td>
<td>$\bar{X} = 4.19$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$sd = 1.35$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability</td>
<td>2.86</td>
<td>2</td>
<td>1.43</td>
<td>0.98</td>
</tr>
<tr>
<td>Treatment x Ability</td>
<td>2.64</td>
<td>2</td>
<td>1.32</td>
<td>0.90</td>
</tr>
<tr>
<td>Residual</td>
<td>204.34</td>
<td>140</td>
<td>1.46</td>
<td></td>
</tr>
</tbody>
</table>

*p < .001
Analysis of covariance revealed no significant effects or interactions for the initial measure of Headings. A significant effect for treatment, in favour of the experimental group was found on the final measure of Headings (F = 368.78, p<.001). The effect size for this difference was 2.83.
CHAPTER V: Summary, Conclusions, Limitations, Implications

In this chapter a summary of the study, conclusions based on results, limitations and implications will be presented. The summary will review the purpose, design, materials and data analyses used. Conclusions will be drawn in relation to: 1) results from the initial test; 2) the six hypotheses generated for the final test; and 3) results of the post hoc analyses of headings. Limitations will address the extent to which results can be generalized. Implications will deal with practical application of these findings and suggest areas for future research.

A. Summary of the Study

The purpose of this study was to determine whether fifth grade students could be sensitized to text structure and headings; and to examine the effects of training for sensitization on measures of quantity or organization of ideas in delayed written recall. Subjects were fifth grade students from 6 parochial school classes. A pretest–posttest non-equivalent group design was used to test six null hypotheses. Conventional group subjects received instruction involving reading and answering questions based on information–classification text. Experimental group subjects received instruction focusing on headings and text structure in the same information–classification selections. Data on Quantity and Organization were analyzed using analysis of covariance with Gates–MacGinitie comprehension scores acting as the covariate. A post hoc examination of headings in initial and final protocols was also conducted using analysis of covariance.
B. Conclusions

1. Initial Test: Quantity and Organization

No significant differences were found between groups prior to treatment on the measures of Quantity and Organization of ideas in delayed written recall. This suggests that the treatment groups were equal in overall ability to perform these tasks at the outset of the study.

2. Final Test: Quantity and Organization

The first of the six hypotheses stated dealt with the quantity of ideas in delayed written recall. The experimental treatment group showed a significantly greater number of ideas recalled than the conventional group ($p<.001$). One possible explanation for this effect is that sensitization to headings as aids to recall enabled students to internalize and reconstruct more of the text. It should be noted that both treatments involved review of passages from memory, but only the experimental treatment drew specific attention to headings and structure. Taylor (1982) has suggested that focusing on the structure of text can lead to higher recall scores. The results of the present study appear to support this.

The effect size of .54 for the first hypothesis indicates the degree of practical significance. The average student in the experimental group scored slightly higher than the 68th percentile of the control group.

The second hypothesis predicted no significant effect for ability group on quantity of ideas in delayed recall. This was shown to be the case. Apparently, when ability
was partialed out, each of the ability groups were equally affected by treatment. This suggests that students at each level of reading competency were developmentally ready for instruction on text structure and headings as aids to recall. Even though less competent readers were functioning at a lower level it appears they performed in a manner similar to more competent readers.

The third hypothesis correctly anticipated that no significant interaction between treatment and reading ability level would be found for the measure of Quantity. Since the three ability levels, low, average and high, were equally affected by the treatments the lack of interaction is not surprising.

The fourth hypothesis, dealing with the effect of treatment on organization of ideas in delayed written recall showed significant results in favour of the experimental treatment (p < .001). It seemed that students who had been sensitized to the relationship between text and headings were better able to use organizational features such as headings, macropropositions and clustering of related ideas in reconstructing the test passage.

The effect size of .94 for the fourth hypothesis suggests that as well as being statistically significant this result was practically significant. The average student in the experimental group scored at the 82nd percentile of the control group.

Results relating to the fifth and sixth hypotheses, dealing with the possibility of an effect for ability level or interaction between ability level and treatment, did not prove to be significant. These combined results suggest that the instruction for headings and text structure was as effective, relative to the conventional instruction, for each of the levels of reading competency.
3. Headings

It is interesting to note that instruction for headings and text structure significantly affects both quantity and organization of ideas in delayed written recall (p<.001). It seems that students at this level can be sensitized to descriptive text structure and headings as cues to that structure. As well, students trained to recognize and use both, demonstrated superior recall in terms of quantity and organization to students who were not trained. This superior performance was consistent across levels of reading competency.

Examining the number of headings used in initial and final protocols also proved interesting. Clearly, there was no significant difference between groups on the number of headings used in the initial protocols. In fact, very few students from either group used headings on the initial protocol. The significant difference (p<.001) in the number of headings used on the final protocol suggests that students in the experimental group definitely were sensitized to headings.

The effect size of 2.83 for headings after treatment indicates the level of practical significance. The average student in the experimental group scored above the 99th percentile of the conventional group. Perhaps findings in earlier studies, showing students at this level to be unable to use headings, resulted from a lack of training.

C. Limitations

Certain aspects of the study should be considered before results are generalized.

1. Although the sample seems to be representative of fifth grade students in Canada, in terms of academic ability, it is possible that factors such as attitude or amount of effort differ between this sample and the population.
2. The question can be raised of a possible Hawthorne effect, due to the investigator teaching the experimental lessons. It is possible that the nature of the experimental lessons, involving some manipulative materials, was more interesting than the routine conventional lessons and this may have caused the results.

3. The time of year at which the study took place may have been a factor. It is possible that results would have differed had the instruction taken place earlier in the school year.

4. It should be noted that the materials used for teaching and testing were written for the independent reading level and it is not known whether the skills transfer to grade level material. However, subsequent to the study, two teachers reported that students were spontaneously using headings and clustering in writing research reports.

5. The period over which instruction took place was relatively brief. It is possible that effects of experimental instruction would be more marked if instruction continued over a longer span of time. It is not known whether particular aspects of the lessons, or the lessons as a whole, were responsible for the observed effects. No argument is being made for the lessons being the best techniques for sensitizing students to headings and text structure.

D. Implications

The results of this investigation suggest that instruction focusing on headings and text structure can aid students in internalizing and reconstructing text. Sensitivity to headings and structure apparently enhances students' memory for what is read and enables them to recall with greater organization. These results are potentially important
to the teaching of both content area reading and writing. In addition to potential positive effects on recall, use of headings and text structure could be taught as an independent study and research strategy.

If students were trained to make use of headings and text structure, comprehension and written organization would likely benefit across the content subjects.

E. Future Research

Additional research should be conducted in this area including investigation of: 1) the effects of a longer period of instruction with progression toward grade level materials; 2) the long term effects of instruction, using more delayed recall measures; 3) the possibility of sensitizing students to expository text structures other than information-classification.
References


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secondary schools. Delaware: IRA.


Estes, T. H. (1972). Reading in the social studies: A review of the research since 1950, in J. Laffey (Ed.), *Reading in the content areas*. Delaware: IRA.


Herber, H. L. (1972). Reading in the social studies: Implications for teaching and research. In J. Laffey (Ed.), *Reading in the content areas*. Delaware: IRA.


Appendix A: Initial and Final Test Passages—Standardized Instructions for Administration of Tests
Standardized Instructions for Administration of Tests

Directions for Written Recall: \((name\ of\ passage)\)

Ensure that each child has a book to read prior to testing.

Hand out the lined paper.

Have students label the paper with name, grade and school.

Each different written protocol should be labelled with the date.

Use the following directions:

"Do your best to write down everything you can remember from the passage on \((passage)\), which you studied yesterday. Don't worry about spelling. You will have up to 25 minutes to write. Please don't talk."

Have individual students paraphrase the directions. You may repeat the standardized directions until you feel certain each child understands.

Direct students:

"You may begin. When you have written everything you remember, turn your paper over and read your library book. Do your very best."

PLEASE REMEMBER TO COLLECT ALL the written protocols.

Protocols and study sheets will be collected by the investigators for analysis.
Standardized Instructions for Administration of Tests

PRIOR TO BEGINNING ensure that each child has a book to read. When they finish studying they should turn their papers over and read quietly.

Directions for Studying Passage: (name of passage)

1. Hand out the test passage face down.

2. EMPHASIZE THE IMPORTANCE OF THESE TESTS.

3. Use the following directions:

"When you turn the paper over you will have 15 minutes to read and study this passage. Use whatever will help you to remember it. You may write on the paper if you need to. Tomorrow you are going to be asked to write down everything you remember, exactly as you remember it."

4. Have individual students paraphrase the directions. You may repeat the standardized instructions until you feel certain each child understands.

5. Direct students to:

"Turn the passage over. Put your name, date and grade on the sheet. PAUSE. You may begin to study. If you need help reading a word put up your hand and I will help you."

PLEASE REMEMBER to collect all the study sheets and return them to their original envelope.
The Parrot Family

Few birds are as interesting and beautiful as parrots. There are more than 700 kinds of birds in the parrot family. People like parrots because they can teach them how to talk. They are also admired for their bright colours.

Different Features

Parrots are very different from other birds. The parrot always has a large beak like a hook. This beak is very strong. The bird uses it to help him climb about. Parrots also use their feet to hold food and to help them climb.

Natural Environment

Parrots can be found in all the warmer parts of the world. South America and Australia have the greatest number of different kinds. Many of them nest in trees. Some nest in cliffs. Still others nest on the ground.

A Parrot's Cage

Of all the birds kept as pets, parrots seem to like cages the most. The parrot's cage should be large enough for him to move easily about without breaking his feathers. Now-a-days most cages are made of stainless steel. This metal is very strong and is easy to clean. Sand or gravel should cover the bottom of the cage. The cage should be cleaned once a week.

Feeding a Parrot

Parrots will eat nearly anything that is given to them. Many things are not good for them, though. They may eat some fruit, but not a lot. The best food for the parrot is a mix of seeds and nuts. Liquid vitamins should be added to the parrot's food. Following these simple rules will keep your parrot healthy and happy for many years.

Name: 
Date: 
Grade: 
Ancient Insects

Few insects have been on the earth as long as termites. They have been around for millions of years. These insects have hardly changed in that time. They have always been about as small as ants.

Natural Environment

Termites can be found in the warmer parts of the world. They live in Africa, Australia and many parts of the tropics. Some termites live underground. Some kinds live in wood. Others live in great piles of earth.

Termites in "Cities"

Termites live in nests that are like cities. Different termites have different jobs. Each nest has a king and queen. They are the parents of all the other termites. Some termites are soldiers. Other termites are workers.

Changes in Appearance

Termites change in appearance as they grow. A termite sheds its skin several times. Each time it grows bigger. Young kings and queens have wings for a short time. They use them only once. They fly to a new home, then they lose their wings.

Harmful Habits

No matter where they make their homes, termites always do much harm. They eat paper and wood. They can eat through a book from cover to cover. Termites can eat tables and chairs. They can chew through the walls of a house. They can eat right through a tree. It is difficult to get rid of termites.
Appendix B: Instructional Procedures and Materials (Conventional Group)
Instructional Procedures and Materials *(Conventional Group)*

Each lesson involves basically the same procedures. Students are to read a content passage and independently answer questions related to that passage. Please do not develop background or extension activities and do not call attention in any way to the paragraph headings.

Most lessons will follow the same sequence:

1. Distribute the completed question sheets from the previous day. Have students share their answers orally, marking and correcting their own written answers. (Accept any and all answers which are correct. It is not necessary for students to include all the points related to a question unless they do this naturally.) Students may not refer to original passage—this is to serve as a recall/review exercise.

2. Collect corrected question sheets before distributing next passage and questions.

3. Direct students to read the new passage and write answers to the questions.

4. Collect the passages and completed question sheets at the end of each lesson.

Lessons which do not exactly follow this sequence are as follows:

**LESSON ONE: May 6**

1. Students write delayed recall of "Termites."
2. AFTER recall is complete and collected, students independently answer questions on termites.
3. Collect completed question sheets to be marked orally on following day.

**LESSON EIGHT: May 15**

This is a special study day. PLEASE USE SPECIAL INSTRUCTIONS!

**LESSON NINE: May 20**

1. Redistribute questions completed) on ANIMALS' EYES.
2. Share answers orally and have students mark.

PLEASE REFER TO THIS SHEET AND YOUR INDIVIDUAL CALENDAR TO ENSURE THAT PROCEDURES ARE CORRECT.
TERMITE QUESTIONS

1. Why are termites called ancient insects?

2. In which parts of the world do termites live?

3. How do termites live?

4. During its life, how does a termite's appearance change?

5. Why are termites harmful?

Name: ___________________
Date: ___________________
Grade: ________________
GRASSHOPPERS

Appearance

Grasshoppers are green in colour. They have three pairs of long, strong legs. A grasshopper has two pairs of wings and one pair of antenna.

Movement

Grasshoppers can move in different ways. The grasshopper uses its long legs to jump high in the air. A grasshopper can also fly with its two pairs of wings. When it wants to get away fast, it hops.

Sounds

A grasshopper has no voice, but it can make sounds. A grasshopper can make sounds by rubbing its top wings together. It can also make a sound by rubbing a wing and a leg together.

QUESTIONS

1. What are some of the physical features of a grasshopper?

2. What are some ways that a grasshopper can move?

3. How does a grasshopper make sounds?

Name: ______________________
Date: ______________________
Grade: ____________________
RICHES OF THE SEA

Farming the Sea

Farming for food under the ocean may soon be possible. There is already much food growing under the water. Scientists hope to make new fishing grounds where the water is not too deep. This kind of "farming" will help feed many people.

Important Riches

Some of the most important riches found under the sea are oil and gas. Lots of rocks under the water have minerals in them. Rocks with copper and nickel are waiting for someone to scoop them up.

Sea Water

Sea water contains gold. In fact the sea holds about 7 trillion dollars worth of gold alone! All the minerals found on land are found in the sea. No one knows how to remove them quickly and cheaply.

Name: ____________________________
Date: _____________________________
Grade: ____________________________
RICHES OF THE SEA

QUESTIONS

1. What new way of getting food may soon be possible?

________________________________________________________________________

2. What are some of the riches found in the sea?

________________________________________________________________________

________________________________________________________________________

3. What is important about the gold contained in sea water?

________________________________________________________________________

________________________________________________________________________

Name: __________________________

Date: __________________________

Grade: ________________________
Leaving The Homeland

Many problems caused the Vikings of Denmark to leave home. The farmland was so poor that hardly any food could be grown. The people fought among themselves to get more land or a place to fish. Many people turned to the sea to find land and riches.

Dragon-Ships

Viking war ships were often called "dragon ships". They had terrifying carved dragon heads on the front of them. Many ships were only as long as a large bus. They usually had one mast and one sail. These wooden ships were moved by oars.

Raiding

The Vikings planned their raids carefully. First they hid their boats. They attacked suddenly and left swiftly. The Vikings killed men, women and children. Some people were taken to be sold as slaves. Everything of value was carried off.

Changed by Christianity

The Vikings changed their ways when they learned about Christianity. Brave missionaries taught the Vikings about religion. Before long the Vikings gave up attacking other people. Many Vikings became good Christians.

Name: ___________
Date: ___________
Grade: ___________
THE VIKINGS OF DENMARK

QUESTIONS

1. Why did the Vikings leave their homeland? ____________________________

2. What were the Viking war ships like? ________________________________

3. How did the Vikings carry out a raid? ________________________________

4. What happened to change the Vikings? ________________________________

Name: _________________________

Date: _________________________

Grade: _________________________
FIRE WALKERS

A Strange Practice

In some lands people have a strange practice of walking through fire. This practice is many centuries old. It is still done today.

Forms of Fire Walking

There are many ways to walk over fire. A barefoot person may walk quickly over coals. Sometimes a person must walk through a log fire or through hot ashes. Other times, the fire walker may cross over red hot stones. Or, ashes may be poured over his head in a fire bath.

Reasons For Fire Walking

There are many reasons why people fire walk. If a chief walks through fire and is not hurt it means that his people will have enough to eat. Other people walk through fire to show their strength. Sometimes a person must walk through fire to show that he did not commit a crime. If the person does not get burned he is set free.

A Mystery

It is a mystery that few fire walkers get burned. Maybe the fire walker strongly believes he will not get hurt. Or the fire walker may breathe in such a way that he does not feel pain. People have checked to see if fire walkers put something on their feet before walking through fire. None ever do.

Name: ____________________
Date: ____________________
Grade: ____________________
FIRE WALKERS

QUESTIONS

1. What strange old custom is still practiced?

2. How is fire walking practiced?

3. Why do people walk through fire?

4. What is still unexplained about people who walk through fire?
ANIMAL PROTECTION

Speed

Many animals can get away from enemies in a hurry. Some, like the deer can run very fast. Birds can fly away very quickly. Others, like squirrels and chipmunks are quick at climbing trees.

Teeth

Some animals use their teeth for protection. Dogs and wolves have long sharp teeth. Some small animals like rats and mink also have sharp teeth. The teeth of some animals such as elephants have become tusks. All these animals use their teeth against their enemies.

Claws

Claws protect some animals. Sometimes they use their claws in fighting other animals. Large birds such as eagles have strong claws. Wild cats like the tiger also use their claws.

Colour

Many animals use their colour for protection. Some birds are hard to see because they are the same colour as the trees. Toads are the colour of dirt. Some animals change colour. The rabbit is white in the winter. Some lizards turn the same colour as the ground or leaves they stand on.

Poison

Some animals use a poison to protect themselves. The sting of a bee or wasp has poison in it. Some spiders can poison larger animals so that they can not move. The sting ray is a fish that uses poison. A sting ray makes a very painful sore. Some snakes also use poison.

Name: ____________________
Date: ____________________
Grade: ____________________
ANIMAL PROTECTION

QUESTIONS

1. What helps some animals escape from their enemies?

2. How can teeth be useful to animals?

3. How do some animals use their claws?

4. Why is colour sometimes a form of protection?

5. What use do animals make of poison?

Name: ____________________
Date: ____________________
Grade: ____________________
HORSES

Horses of Long Ago

The first horses lived on the earth in the time of the dinosaurs. Then the horses were about the size of a fox. The meat-eating dinosaurs hunted them for food. When they were eating the horses had to watch out for danger.

Horses Changed

Over millions of years the horses changed. At first they had four toes on each front foot. They had three toes on each back foot. Now they have only one hoof on each leg. Their legs became longer. This helped them run away from danger.

Plant Eaters

Horses have always eaten plants. The first horses ate more leaves and fruit. Now a horse eats grass, hay and grain. Sometimes they have a carrot for a special treat. A horse has teeth made for grinding grasses. When a horse eats in a field it covers a lot of ground. It eats almost all day long.

The Way Horses Live

Some horses live in the wild and some horses are tame. Zebras and mustangs are wild horses. Wild horses stay together in big herds. Each herd has a leader. Tame horses have owners to feed and take care of them. Many owners have only one horse.

Useful Horses

Man has found many uses for horses. Cave men killed horses for meat. Horse skins have been used for clothes and tents. Later, men used horses for carrying heavy loads. Before there were cars, horses pulled wagons. Now they are used mostly for riding and racing.

Name: 
Date: 
Grade: 
HORSES

QUESTIONS

1. What were the first horses like?

2. How have horses changed?

3. What do horses eat?

4. What are some types of horses?

5. How have horses been useful to man?

Name: ___________________________
Date: __________________________
Grade: ________________________
Amazing Sight

Each animal's eyes are special. The eyes help the animal get information. Animal's eyes are different because they need different information to live.

The Rabbit

The rabbit has eyes that see in a complete circle. A rabbit can look all around itself without moving its head. This helps the rabbit when it is being chased. The rabbit can watch where he is going and see his enemy behind him at the same time.

The Lizard

Some lizards have eyes that stick out. One eye can look back while the other looks ahead. The lizard's eyes help protect it from enemies. It can look for food with one eye and watch for trouble with the other.

The Owl

The owl's eyes can see at night. This helps it hunt for animals. From the branch of a tree the owl can see anything moving on the ground. Even small rats and mice can be seen in the dark by an owl.

The Toad

A toad's eyes help in eating. First the toad's eyes help it find its favourite food - worms. Then the eyes help the toad move food through its mouth. When the toad closes its eyes it can lower them through a door in the roof of its mouth. The eyes hold the slippery food still until the toad can swallow it.

Name: _____________
Date: ______________
Grade: ____________
ANIMALS' EYES

QUESTIONS

1. Why do different animals have different eyes?

2. What is special about the rabbit's eyes?

3. What is special about some lizard's eyes?

4. How are the owl's eyes useful?

5. What can a toad use his eyes for?

Name:

Date:

Grade:
Appendix C: Instructional Procedures and Materials (Experimental Group)
Instructional Procedures and Materials (*Experimental Group*)

LESSON ONE (60 min.): THE DIFFERENCE BETWEEN INFORMATION MATERIAL AND NARRATIVE MATERIAL

I **INTENDED LEARNING OUTCOMES:**

The students will be able to:

- sort narrative sequence strips
- sort information strips
- describe the difference between narrative and information material
- use headings to study for recall of details
- identify heading from a group of ideas

II **MATERIALS:**

- Class set of sequence strips for *Goldilocks and the Three Bears*
- Display sequence strips for *Goldilocks and the Three Bears*
- Class set of content strips for *Grasshoppers*
- Display strips for *Grasshoppers*
- 2 pocket charts
- masking tape
- Chart: DIFFERENCES BETWEEN STORY AND INFORMATION MATERIAL (see example)
- felt pens

III **PROCEDURES:**

A. **NARRATIVE MATERIAL**

1. Place *Goldilocks* story strips in disordered arrangement in the pocket chart.
2. Discuss:
   a. "What are these strips all about?" (The story of *Goldilocks and the Three Bears*)
   b. "Which strip would be the title?" (*Goldilocks and the Three Bears*).
   c. "Does this make sense? What would you have to do to make it sensible?" (Put them in order).
   d. Distribute *Goldilocks* sequence strip envelopes and direct students to arrange the ideas so they make sense.
   e. Circulate and observe sorting. Students may work in pairs.
   f. When students have finished sorting, call on individual students to tell how strips are sequenced. Display the strips sequentially in the pocket chart. Ask individual students to justify the placement of each idea. After all sequencing has been completed, ask: "Did anyone have to change the arrangement of their strips? What did you have to change? Why?"

B. INFORMATION MATERIAL

1. Place disordered *Grasshoppers* strips in the second pocket chart.

2. Discuss:
   a. "What is this all about? (*Grasshoppers*).
   b. "Is there one strip that could be a title?" (*Grasshoppers*).
   c. "Does this make sense? Why not? What needs to be done?"
   d. "Can you see any ideas that are more important than others?" (how a grasshopper moves, how a grasshopper makes sounds, a grasshopper's physical features).
3. Give the directions: "Open your envelope. Take the strips out and see if you can find all the ideas that go with these main ideas."

4. Circulate and observe sorting. Students may work in pairs.

5. Call on individual students to tell how ideas are organized. Display the organization in the pocket chart. Ask: "What details did you put with these main ideas?" Require that students justify their placement of ideas.

6. Ask:
   a. "What do we call these main ideas?" (headings).
   b. "How did you arrange these ideas on your desk?"
   c. "How could the strips be arranged so that the headings are easier to find?" (set heading to the left of the details).
   d. "If I set these off to the side it is easier to see how the ideas fit together." e.g.

   Heading
   
   idea
   
   idea
   
   idea

   Heading
   
   idea
   
   idea
   
   idea
C. DISCUSS THE DIFFERENCE BETWEEN NARRATIVE AND INFORMATION MATERIAL

1. Ask:
   a. "Which set of cards is a story? How do you know it is a story?"
   b. "Which one is giving us information. How do you know this is not a story?"
   c. "What makes it different from story material?"

2. Display chart for recording differences between narrative and information material.
   a. Say: "Let's look at the differences between story and information material.
   b. Teacher writes on board or on chart paper as students give answers to the following questions:
### DIFFERENCES BETWEEN STORY AND INFORMATION MATERIAL

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>GOLDILOCKS</th>
<th>GRASSHOPPERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Why was the material written?</td>
<td>(enjoyment)</td>
<td>(information)</td>
</tr>
<tr>
<td>b) Describe how the material is written.</td>
<td>(chronological, time sequence, sequence of events, etc.)</td>
<td>(title, headings, main ideas, details)</td>
</tr>
<tr>
<td>How is the material organized?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) How do you read it?</td>
<td>(from beginning to end)</td>
<td>(only need to read the part that gives you the information)</td>
</tr>
<tr>
<td>d) In the information material what helps you find the details?</td>
<td></td>
<td>(headings)</td>
</tr>
</tbody>
</table>

### D. THE USEFULNESS OF HEADINGS

1. Say: "Paying attention to the headings can also help you to remember information better. If I turn these details over and you turn yours over, could you remember the details that go with this heading?" (Do this for each section).

2. "Now study the headings silently. When you think you can remember them turn them over. See if you can remember each heading and the details that go with each." Have students orally recall the details that go with each heading.
3. Direct students to study the headings. Turn the display headings over and have students do the same. Have students orally recall the headings and details associated with each heading.

4. Say: "Tomorrow you will be asked to tell me the headings and details for *Grasshoppers*. You’ll use the headings to remember the details for each section."
flies

hops

green in colour

by rubbing its wings together

three pairs of long strong legs

jumps

one pair of antennae

how grasshoppers make sounds

grasshoppers

ways a grasshopper moves

two pairs of wings

by rubbing a wing and leg together

a grasshopper's physical features
has no voice

She eats baby bear’s porridge.

She goes to sleep.

Mother bear makes some porridge.

The bears decide to go for a walk.

They find Goldilocks.

The porridge is too hot.

The bears come home.

She breaks baby bear’s chair.

She goes to the bears’ house.

Along comes Goldilocks.

She runs away.

Goldilocks and the Three Bears
LESSON TWO (60 mins.): IDEA SORTING

I INTENDED LEARNING OUTCOMES:

The students will be able to:

- recall headings and details from Grasshoppers information strips studied previous day
- select a single heading from a group of related ideas
- sort up to eight 2 level cut-up outlines according to headings and details
- use headings to study for recall

II MATERIALS:

- pocket chart
- class set of eight cut-up outlines, each outline in an envelope, all eight bundled together (Catterson, 1966)
- Grasshopper display strips used last day
- Display strips used last day
- Display strips for eight cut-up outlines
- Class set of SORTING IDEAS worksheets

III PROCEDURES:

A. RECALL OF GRASSHOPPER INFORMATION

1. Direct students to think about what they studied on previous day.

2. Direct students to recall headings from the Grasshoppers selection.

3. Direct students to recall associated details for each heading of the selection.
   (Teacher displays heading strips and details strips in pocket chart as ideas are recalled).
4. Turn detail strips over again and remind students of how to use headings to recall details.

5. Have students retell the difference between narrative and information material (e.g. "What kind of material did we say this is? How is it different from story material?").

B. FINDING THE MAIN IDEA

1. Distribute worksheet SORTING IDEAS.

2. Direct students to read silently the first row of ideas to find the main idea.

3. Have one student read the ideas.

4. Direct student to underline the main idea.

Continue in the same fashion for the remainder of the worksheet.

C. IDEA SORTING

1. Direct students to open envelope #1 and to find the title for the ideas. Then direct students to sort the details under the appropriate headings.

2. Share and discuss arrangement of ideas. Visually display in pocket chart. Emphasize the way that ideas are related.

3. Turn details over and have students orally recall content using headings as cues for recall.

   Follow steps 2 to 4 for as many of the 8 cut-up outlines as time permits. (Standardize the number of outlines per class). Before the sorting of subsequent outlines, have students tell which steps they will use for organizing strips.
4. For final cut-up outline, follow the same procedures used for previous outlines. Then direct students to study the outline to be recalled the next day. Say:
"Tomorrow you will be asked to use the headings to remember the ideas about (title of final cut-up outline)."
A. CHOOSE THE MAIN IDEA FROM THESE IDEAS:
1. maple elm trees oak birch beech
2. shoes socks clothes sweater stockings blouses
3. horses animals sheep cows deer dogs
4. football hockey games tennis baseball
5. farmers firemen workers milkmen teachers
6. beef pork lamb mutton meat
7. rose tulip violet iris flowers daffodil

B. WRITE THE MAIN IDEA FOR EACH GROUP:
1. boxes trunks drawers jars bottles ______
2. sailboat canoe rowboat liner ______
3. milk gas oil vinegar Coke water ______
4. collie terrier poodle sheepdog ______
5. apple grapefruit mango strawberry ______
6. overshoes slippers socks sandals boots ______
7. pansy forget-me-not tulip peony daisy ______
<table>
<thead>
<tr>
<th>1. sweet things</th>
<th>2. foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. dessert</td>
<td>2. grains</td>
</tr>
<tr>
<td>1. cake</td>
<td>2. corn</td>
</tr>
<tr>
<td>1. ice cream</td>
<td>2. wheat</td>
</tr>
<tr>
<td>1. pudding</td>
<td>2. rye</td>
</tr>
<tr>
<td>1. Coca Cola</td>
<td>2. fruits</td>
</tr>
<tr>
<td>1. drinks</td>
<td>2. peaches</td>
</tr>
<tr>
<td>1. chocolate</td>
<td>2. pears</td>
</tr>
<tr>
<td>1. Seven-Up</td>
<td>2. apples</td>
</tr>
<tr>
<td>1. candy</td>
<td>2. oranges</td>
</tr>
<tr>
<td>1. lollipops</td>
<td>2. vegetables</td>
</tr>
<tr>
<td>1. apple pie</td>
<td>2. carrots</td>
</tr>
<tr>
<td>2. oats</td>
<td>2. peas</td>
</tr>
<tr>
<td>3. clothes</td>
<td>4. living things</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>3. for the feet</td>
<td>4. flying creatures</td>
</tr>
<tr>
<td>3. shoes</td>
<td></td>
</tr>
<tr>
<td>3. rubber boots</td>
<td>4. birds</td>
</tr>
<tr>
<td>3. slippers</td>
<td>4. insects</td>
</tr>
<tr>
<td>3. for the head</td>
<td>4. bats</td>
</tr>
<tr>
<td>3. hats</td>
<td></td>
</tr>
<tr>
<td>3. caps</td>
<td>4. plants</td>
</tr>
<tr>
<td>3. for the hands</td>
<td>4. flowers</td>
</tr>
<tr>
<td>3. gloves</td>
<td>4. trees</td>
</tr>
<tr>
<td>3. mittens</td>
<td>4. bushes</td>
</tr>
<tr>
<td></td>
<td>4. fish</td>
</tr>
<tr>
<td></td>
<td>4. Swimming creature</td>
</tr>
<tr>
<td></td>
<td>4. eels</td>
</tr>
</tbody>
</table>

*Note: The handwriting appears to be a list of items, possibly for a nature or science classification exercise.*
| 5. furniture | 6. to wear |
| 5. sit on | 6. clothing |
| 5. to lay on | 6. shoes |
| 5. chairs | 6. stockings |
| 5. benches | 6. blouses |
| 5. stools | 6. skirts |
| 5. beds | 6. jewellery |
| 5. couches | 6. rings |
| 5. floor coverings | 6. watches |
| 5. mats | 6. bracelets |
| 5. rugs | 6. beads |
| 5. carpets | 6. earrings |
| 5. tile |
## Workers in and outdoors

<table>
<thead>
<tr>
<th>Indoors</th>
<th>Outdoors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workers</td>
<td>milkman</td>
</tr>
<tr>
<td>grocer</td>
<td>postman</td>
</tr>
<tr>
<td>butchers</td>
<td>lumberjack</td>
</tr>
<tr>
<td>tailors</td>
<td>clerks</td>
</tr>
<tr>
<td>farmers</td>
<td>typists</td>
</tr>
</tbody>
</table>

## Living things

<table>
<thead>
<tr>
<th>In the sea</th>
<th>On land</th>
</tr>
</thead>
<tbody>
<tr>
<td>living things</td>
<td>living things</td>
</tr>
<tr>
<td>sharks</td>
<td>halibut</td>
</tr>
<tr>
<td>whales</td>
<td>oysters</td>
</tr>
<tr>
<td>seaweed</td>
<td>lobsters</td>
</tr>
<tr>
<td>sharks</td>
<td>trees</td>
</tr>
<tr>
<td>whales</td>
<td>lions</td>
</tr>
<tr>
<td>seaweed</td>
<td>tigers</td>
</tr>
<tr>
<td>sharks</td>
<td>flowers</td>
</tr>
</tbody>
</table>
LESSON THREE (60 mins.): RICHES OF THE SEA

I INTENDED LEARNING OUTCOMES:

The students will be able to:

- recall headings and details from the cut-up outline studied previous day
- read Riches of the Sea passage
- match cut-up outline to the text
- identify headings
- underline details in each paragraph of the passage
- record headings and details in side bar outline

II MATERIALS:

- Living Things display strips or final cut-up outline used on previous day
- pocket chart
- class set of Riches of the Sea passage
- Display cut-up outline for Riches of the Sea
- class set of cut-up outline for Riches of the Sea

- chart: STUDY PROCEDURES FOR INFORMATION MATERIAL

III PROCEDURES:

A. RECALL OF 'LIVING THINGS' INFORMATION

1. Direct students to think about what they studied on previous day.

2. Direct students to recall headings from the Living Things outline.

3. Direct students to recall associated details for each heading. (Teacher displays heading strips and detail strips in pocket chart.)
4. Turn detail strips over and remind students of how to use headings to recall details.

B. RICHES OF THE SEA

1. Distribute Riches of the Sea cut-up outline packets.

2. Distribute Riches of the Sea passage (face down).

3. Say: "Today you are going to learn how to read information material so that you can remember it."

4. Go over Study Procedures for Information Material chart.

**HOW TO STUDY INFORMATION MATERIAL**

Survey: Read the title and headings.

Read: the section that goes with each heading.

Write the heading. Do this for each section.

Go back and find the details for each section.

Study. (Practise remembering what goes with each heading.)

5. Have students turn passage over. Draw attention to the chart, guiding students through each study procedure step:

a. Direct students to survey the title and heading of the passage. Ask: "What three things will you find out about Riches of the Sea?"

b. Direct students to read each heading and section silently to find the cut-up outline heading for each section.

c. Direct students to go back to the beginning of the passage. Have
students silently read each section and find cut-up details for each section.

d. Circulate, discuss organization of ideas, and use pocket chart to display organization of cut-up outline.

6. Direct students to put cut-up outlines away.

7. Direct students to read the passage, section by section, and to write the headings in the blank outline.

8. Guide students to underline details for each section of the passage.

9. Guide students in outlining the details associated with each heading, following the text section by section. If necessary, use the chalkboard to display how this is to be done.

10. Direct students to study the outline, section by section, for the next day’s recall task. Have the students practise remembering the details associated with each heading.
RICHTS OF THE SEA

Farming the Sea

Farming for food under the ocean may soon be possible. There is already much food growing under the water. Scientists hope to make new fishing grounds where the water is not too deep. This kind of "farming" will help feed many people.

Important Riches

Some of the most important riches found under the sea are oil and gas. Lots of rocks under the water have minerals in them. Rocks with copper and nickel are waiting for someone to scoop them up.

Sea Water

Sea water contains gold. In fact the sea holds about 7 trillion dollars worth of gold alone! All the minerals found on land are found in the sea. No one knows how to remove them quickly and cheaply.

Name: ____________________________
Date: ________________
Grade: _________________
Riches of the Sea

copper and nickel

scientists hope to make shallow fishing grounds

oil and gas are the most important

Farming the Sea

this "farming" will feed many people

Important Riches

7 trillion dollars worth of gold

rocks with minerals

much food under water

all minerals found on land are found in the sea
sea water has gold

ocean farming may soon be possible

Sea Water

can't get minerals from sea water quickly and cheaply
LESSON FOUR (60 min.): THE VIKINGS OF DENMARK

I INTENDED LEARNING OUTCOMES:

Students will be able to:

- recall headings and details from the cut-up outline studied previous day (Riches of the Sea)
- read Vikings passage
- match cut-up outline to Vikings passage
- identify headings
- underline details in each paragraph of the passage
- record headings and details in a side bar outline

II MATERIALS:

- Riches of the Sea display strips used last day
- 2 pocket charts
- class set of The Vikings of Denmark passage
- Display cut-up outline for Vikings...
- class set of cut-up outline for Vikings...
- chart: STUDY PROCEDURES FOR INFORMATION MATERIAL

III PROCEDURES:

A. RECALL TASK

1. Direct students to recall headings from Riches of the Sea.

2. Direct students to recall details.

3. Emphasize the relationship between headings and details and how headings can aid in the recall of details.
B. VIKINGS OF DENMARK

1. Distribute *Vikings of Denmark* cut-up outline packets.

2. Distribute *Vikings of Denmark* passage.

3. Use chart to review study procedures for information material.

4. Guide students through each study procedure step:
   a. Direct students to survey title and headings. Then ask: "What 4 things will you find out about the Vikings of Denmark?"
   b. Direct students to read each heading and section silently to find the cut-up outline heading for each section of the text.
   c. Direct students to go back to the beginning of the passage. Have students silently read each section to find cut-up outline details for each section. Circulate, discuss organization of ideas and the relationship of the headings to the details. Use pocket chart to display organization of cut-up outline.

5. Direct students to put cut-up outlines away.

6. Guide students in underlining details in the first paragraph of the passage. After students underline the details say: "Now that we’ve looked at the details what is another way that the heading can be stated?" Continue this process for the remainder of the paragraphs.

7. Direct students to write the headings in the blank outline.

8. Direct students to write the details associated with each heading in the outline. If necessary, use the chalkboard to display how this is done. Say: "Try to think
of each detail without looking at the passage. Check before you write them down."

9. Direct students to study the completed outline section by section for the next day's recall task. Have the students practise remembering the details associated with each heading.
Leaving The Homeland

Many problems caused the Vikings of Denmark to leave home. The farmland was so poor that hardly any food could be grown. The people fought among themselves to get more land or a place to fish. Many people turned to the sea to find land and riches.

Dragon Ships

Viking war ships were often called "dragon ships". They had terrifying carved dragon heads on the front of them. Many ships were only as long as a large bus. They usually had one mast and one sail. These wooden ships were moved by oars.

Raiding

The Vikings planned their raids carefully. First they hid their boats. They attacked suddenly and left swiftly. The Vikings killed men, women, and children. Some people were taken to be sold as slaves. Everything of value was carried off.

Changed by Christianity

The Vikings changed their ways when they learned about Christianity. Brave missionaries taught the Vikings about religion. Before long the Vikings gave up attacking other people. Many Vikings became good Christians.
Changed by Christianity

fighting for land and fishing places

some about as long as a bus

hid their boats

one mast and one sail

changed when they learned about Christianity

Dragon Ships

many became good Christians

killed men, women and children

turned to the sea to find new land and riches

left swiftly

moved by oars

made of wood
poor land, no food

warships often called "dragon ships"

planned carefully

Vikings

attacked suddenly

gave up attacking people

all valuable things carried off

Leaving the Homeland

terrifying carved dragon heads on the front

many problems

Raiding

missionaries taught them religion

took some slaves
LESSON FIVE (60 mins): FIRE WALKERS

I INTENDED LEARNING OUTCOMES:

The students will be able to:
- recall headings, main ideas and details from previous passage
- survey title, headings
- read passage Fire Walkers
- recognize alternate headings
- identify main ideas and describe relation to headings
- study headings and associated ideas for recall in next session

II MATERIALS:
- Display strips: Vikings of Denmark
- Pocket chart
- Class set: Fire Walkers passage; Fire Walkers outline

III PROCEDURES:
1. Direct students to recall headings from Vikings of Denmark; then recall details for each section. Emphasize the main idea or topic sentence in each and denote with an asterisk. (Have students state details in sentences.)

2. Distribute Fire Walkers passage and outline.

3. Review study procedures.

4. Direct students to survey title and headings. Discuss.

5. Draw attention to details and alternate headings at bottom of outline. (These are
to be crossed off as they are used.)

6. Guide students through silent reading of each section and location of alternate heading to be recorded in outline.

7. When all alternate headings are recorded have students turn papers over.

8. Review remaining study procedures adding identification of main ideas with an asterisk (*).

9. Return to first section and guide students through locating main idea (to be starred in the outline) and associated details.

10. Continue guidance for each section until it is apparent that students can complete the task independently. Circulate and mark.

11. Direct students to study the passage and outline for recall in next session.
A Strange Practice

In some lands people have a strange practice of walking through fire. This practice is many centuries old. It is still done today.

Forms of Fire Walking

There are many ways to walk over fire. A barefoot person may walk quickly over coals. Sometimes a person must walk through a log fire or through hot ashes. Other times, the fire walker may cross over red hot stones. Or, ashes may be poured over his head in a fire bath.

Reasons For Fire Walking

There are many reasons why people fire walk. If a chief walks through fire and is not hurt it means that his people will have enough to eat. Other people walk through fire to show their strength. Sometimes a person must walk through fire to show that he did not commit a crime. If the person does not get burned he is set free.

A Mystery

It is a mystery that few fire walkers get burned. Maybe the fire walker strongly believes he will not get hurt. Or the fire walker may breathe in such a way that he does not feel pain. People have checked to see if fire walkers put something on their feet before walking through fire. None ever do.
Unusual Practice
- many reasons
- fire bath
- feet have been checked
- barefoot over coals
- to prove innocence
- over red hot stones
- they walk through fire
- to show strength
- centuries old
- still done

- many types of fire walking
- mystery that people don't get burned
- people don't put anything on feet

Types of Fire Walking
- chief finds out if people will have food
- person set free if not burned
- through a log fire or hot ashes
- maybe special breathing stops pain

A Question With No Answer
- some peoples have a strange practice

Why People Walk Through Fire
- may be strong beliefs
LESSON SIX (60 mins.): ANIMAL PROTECTION

I INTENDED LEARNING OUTCOMES:
The student will be able to:
- recall headings, main ideas and details from Fire Walkers
- review study procedures
- read Animal Protection passage
- complete a written outline to match text
- study for recall

II MATERIALS:
- Chalkboard
- Class set: Animal Protection passage

III PROCEDURES:
1. Direct students to recall title and headings for Fire Walkers. Record on board, leaving space for associated details.

2. Direct and record starred main idea and related details for each heading, one at a time. Review relation between headings and ideas.

3. Review study steps to date:
   a. Survey title, headings
   b. Read each section and record its heading (or similar headings) in outline
   c. When all headings are recorded return to first section and note main idea (*) and details for one section at a time
   d. When outline is complete, study for recall

5. Guide students through each step using the passage. Allow individual students to decide whether underlining and recording in outline are required. Permit students to complete final sections independently if they feel able.

6. Direct students to study passage and/or outline for recall on following day.
Many animals can get away from enemies in a hurry. Some, like the deer, can run very fast. Birds can fly away very quickly. Others, like squirrels and chipmunks, are quick at climbing trees.

Teeth

Some animals use their teeth for protection. Dogs and wolves have long, sharp teeth. Some small animals like rats and mink also have sharp teeth. The teeth of some animals such as elephants have become tusks. All these animals use their teeth against their enemies.

Claws

Claws protect some animals. Sometimes they use their claws in fighting other animals. Large birds such as eagles have strong claws. Wild cats like the tiger also use their claws.

Colour

Many animals use their colour for protection. Some birds are hard to see because they are the same colour as the trees. Toads are the colour of dirt. Some animals change colour. The rabbit is white in the winter. Some lizards turn the same colour as the ground or leaves they stand on.

Poison

Some animals use a poison to protect themselves. The sting of a bee or wasp has poison in it. Some spiders can poison larger animals so that they can not move. The sting ray is a fish that uses poison. A sting ray makes a very painful sore. Some snakes also use poison.
LESSON SEVEN (60 mins.): HORSES

I INTENDED LEARNING OUTCOMES:

The student will be able to:

- Recall headings, main ideas (*) and details from Animal Protection (oral)
- review study procedures
- identify main idea (*)
- read Horses passage
- record original or alternate headings in outline
- practise completing outline from recall
- study for recall

II MATERIALS:

- Chalkboard
- Class set: Horses passage, with outline folded under

III PROCEDURES:

1. Guide recall of Animal Protection recording on board (as in previous sessions).

2. Review study procedures. (Note that underlining is optional; each individual must decide what he can do in time allotted.)

3. Distribute Horses passage.

4. Direct students to survey and turn papers over. Recall.

5. Guide through first three (or more) sections writing original or appropriate alternate headings in outline.
6. Turn paper over. Fifteen minutes will be allotted to study passage. Discuss best study techniques (survey, record headings, return and underline details, practise remembering).

7. At end of fifteen minutes direct students to turn papers over to outline and begin completing each section from recall.

8. When students can recall no more details they may complete outline by referring to passage.

9. Study to recall for next session.
Horses of Long Ago

The first horses lived on the earth in the time of the dinosaurs. Then the horses were about the size of a fox. The meat-eating dinosaurs hunted them for food. When they were eating the horses had to watch out for danger.

Horses Changed

Over millions of years the horses changed. At first they had four toes on each front foot. They had three toes on each back foot. Now they have only one hoof on each leg. Their legs became longer. This helped them run away from danger.

Plant Eaters

Horses have always eaten plants. The first horses ate more leaves and fruit. Now a horse eats grass, hay and grain. Sometimes they have a carrot for a special treat. A horse has teeth made for grinding grasses. When a horse eats in a field it covers a lot of ground. It eats almost all day long.

The Way Horses Live

Some horses live in the wild and some horses are tame. Zebras and mustangs are wild horses. Wild horses stay together in big herds. Each herd has a leader. Tame horses have owners to feed and take care of them. Many owners have only one horse.

Useful Horses

Man has found many uses for horses. Cave men killed horses for meat. Horse skins have been used for clothes and tents. Later, men used horses for carrying heavy loads. Before there were cars horses pulled wagons. Now they are used mostly for riding and racing.
LESSON EIGHT (2 sessions: 60 mins; 30 mins.): ANIMALS' EYES

I INTENDED LEARNING OUTCOMES:
The student will be able to:
- recall headings, main ideas (*) and details from Horses
- review study procedures
- read and study Animals' Eyes in timed session (15 minutes)

II MATERIALS:
- Chalkboard
- Class set: Animals' Eyes passage

III PROCEDURES:
PART ONE
2. Emphasize the relationship between details and headings.
3. Review study procedures and discuss most efficient use of limited time. (Most likely: Survey, record headings, return and underline, practise remembering. Some students will find underlining too slow in this timed session—they may be permitted to read without underlining.)
4. When each student has decided on the most efficient strategy distribute Animals' Eyes passage and allow fifteen minutes study time. (Use Standardized Instructions.)

PART TWO
1. On subsequent day allot twenty-five minutes for written recall of passage. (This
session to be directed by all classroom teachers using Standardized Instructions.)
Amazing Sight

Each animal's eyes are special. The eyes help the animal get information. Animals' eyes are different because they need different information to live.

The Rabbit

The rabbit has eyes that see in a complete circle. A rabbit can look all around itself without moving its head. This helps the rabbit when it is being chased. The rabbit can watch where it is going and see its enemy behind him at the same time.

The Lizard

Some lizards have eyes that stick out. One eye can look back while the other looks ahead. The lizard's eyes help protect it from enemies. It can look for food with one eye and watch for trouble with the other.

The Owl

The owl's eyes can see at night. This helps it hunt for animals. From the branch of a tree the owl can see anything moving on the ground. Even small rats and mice can be seen in the dark by an owl.

The Toad

A toad's eyes help in eating. First the toad's eyes help it find its favourite food - worms. Then the eyes help the toad move food through its mouth. When the toad closes its eyes it can lower them through a door in the roof of its mouth. The eyes hold the slippery food still until the toad can swallow it.

Name: ____________
Date: ____________
Grade: ____________
LESSON NINE (30 min.): REVIEW

I INTENDED LEARNING OUTCOMES:

The students will be able to:

- describe study procedures for information material
- discriminate between appropriate and inappropriate study procedures

II MATERIALS:

- chalkboard
- Example: protocol of *Animals' Eyes* (one organized passage and one disorganized passage)

III PROCEDURES:

1. Direct students to read the two protocols to determine which is better organized and easier to understand. Discuss.

2. Guide students through reorganization of disorganized passage. Teacher writes reorganized information on chalkboard.

3. Review study procedures. Emphasize:
   a. Use of headings
   b. Spending equal time on the study of each paragraph
   c. Practising to remember what is associated with each heading.
Appendix D: Scoring Procedures
Scoring Procedures (Quantity)

Each passage had 31 ideas including (5) macropropositions and (26) micropropositions. Scoring for quantity of ideas was unweighted; thus, macro and micropropositions were of equal value. The following procedures were used to assign full or part value to each idea recalled:

A. MACROPROPOSITIONS

Regardless of its position

1. Each complete macroproposition (original or paraphrased) was assigned a score of \(1\).

\[
\text{No matter where termites make their nests (1/2)}
\]

\[
\text{termites always do much damage (1/2) = (1) (original, complete)}
\]

\[
\text{termites do much damage wherever they make their nests = (1)}\text{ (complete, paraphrased)}
\]

\[
\text{Termites always do much damage = (1/2) (partial)}
\]

\[
\text{Termites are very bad to have = (1/4) (distortion)}
\]

\[
\text{No matter where termites make their nests they are very bad to have = (3/4) (partial/distortion)}
\]

2. Distorted or partially reproduced macropropositions received appropriate partial scores (1/4, 1/2, 3/4).

B. INFERRED MACROPROPOSITIONS

The original Parrots passage as used by Stables contained one macro proposition, the gist of which could be inferred from related micropropositions. Since it was necessary that both tests be similar in structure, the Termites passage also contained one
macroproposition which could be inferred from related micropropositions.

For example, if a student wrote:

Parrots like cages. The cages need to be cleaned once a week. They are made of stainless steel.

it could be inferred that the student recalled that pet parrots are kept in cages.

Likewise, if a student wrote:

Termite nests are like cities. Each nest has a king and queen . . .

it could be inferred that the student recalled that termites live in nests.

When inferred, each of these two macropropositions received a score of (1/2).

C. MICROPROPOSITIONS

1. Each complete microproposition was assigned a score of (1). For example:

   Young kings (1/4) and queens (1/4) have wings for a short time (1/2) = (1) (original, complete)

   For a short time young kings and queens have wings = (1) (complete, paraphrased).

2. Distorted or partially reproduced macropropositions received appropriate partial scores. (1/4, 1/2, 3/4)

   They have young queens = (1/4) (partial)

   Termites have wings for a short time = (1/2) (partial)

   Young queens (1/4) have wings for a short time (1/2) = (3/4) (partial)

   Young kings (1/4) and queens (1/4) fly for a short time (1/4) = (3/4) (partial/distortion).

D. HEADINGS
Headings were not scored as ideas unless they paraphrased a complete or partial macroproposition or microproposition. For example, because the heading

**Harmful Habits** partially paraphrases the macroproposition *No matter where termites make their nests* (1/2) *they always do much damage* (1/2) it was assigned (1/2).

Because the heading *Wood Eating Insects* partially paraphrases the microproposition *They eat paper* (1/2) *and wood* (1/2) it was assigned (1/2).

**Note:**

Each macro or microproposition could receive a total score no greater than (1). Thus, any full or partial proposition which was repeated was to be scored only once.

Example:

*Young kings* (1/4) *have wings for a short time* (1/2)

*Young queens* (1/4) *also have wings for a short time* (1/2) = (1) (complete)
Scoring Procedures (Organization)

Each passage had a potential score of (61) for organization. Scores for organization were calculated using the following weightings and procedures:

A. MACROPROPOSITIONS

1. Regardless of its position each complete (original or paraphrased) macroproposition received a score of (5).

2. Distorted or partially reproduced macropropositions received appropriate partial scores (1 1/4, 2 1/2, 3 3/4). (This was parallel to the procedures for scoring quantity.) For example:

   *No matter where termites make their nest (2 1/2) they always do much damage (2 1/2) = (5) (complete).*

   *Termites always do much damage = (2 1/2) (partial)*

B. INFERRED MACROPROPOSITIONS

The original *Parrots* passage as used by Stables contained one macroproposition, the gist of which could be inferred from related micropropositions. Since it was necessary that both tests be similar in structure, the *Termites* passage also contained one macroproposition which could be inferred from related micropropositions.

   For example, if a student wrote:

   *Parrots like cages. The cages need to be cleaned once a week. They are made of stainless steel.*

   it could be inferred that the student recalled that *pet parrots are kept in cages.*

   Likewise, if a student wrote:
Termite nests are like cities. Each nest has a king and queen . . .

it could be inferred that the student recalled that termites live in nests.

When inferred, each of these two macropropositions received a score of (2 1/2).

C. MICROPROPOSITIONS

1. Values assigned to complete, partial and distorted micropropositions followed the same procedures as used for determining quantity (1/4, or 1/2, or 3/4, or 1).

2. Micropropositions must have occurred in related clusters of at least two in order to be included in the organization score. That is, any two or more ideas from the same paragraph which were written consecutively were treated as a cluster. Microproposition clusters could consist of one macroproposition and one or more microproposition; or two or more micropropositions).

For example, the following protocol contains one cluster:

Termites are found in warmer places like Africa and Australia. They are about as little as ants. They have been around for millions of years. They like to live in wood.

This would be indicated on the protocol as the following:

\[\begin{align*}
(\ ) & \ (\ ) \ (\ ) \ 1. \text{ Few insects have been on earth as long} \\
& \{ (1) (++) a) have existed for millions of years \\
& \ (\ ) (\ ) b) have hardly changed in that time \\
& \ (1) (++) c) about as small as ants \\
(\ ) & \ (5) (++) 2. \text{ Termites are found in warmer parts of the world} \\
& \{ (1) (++) a) Africa \\
& \ (1) (++) b) Australia \\
& \ (\ ) (\ ) c) many parts of the tropics \\
& \ (\ ) (\ ) d) some live underground \\
& \ (\ ) (++) e) some live in wood \\
& \ (\ ) (\ ) f) others live in great piles of earth
\end{align*}\]
3. Only one cluster per section is scored. That is, if clusters of ideas from one section occur in two parts of the protocol, only the clusters of greatest value are scored. For example:

Termites are found in warm parts of the world such as the tropics. They are about as small as ants. Some live underground. Some live in wood.

1. Few insects have been on earth as long
   a) have existed for millions of years
   b) have hardly changed in that time
   c) about as small as ants

2. Termites are found in warmer parts of the world
   a) Africa
   b) Australia
   c) many parts of the tropics
   d) some live underground
   e) some live in wood
   f) others live in great piles of earth

4. Single micropropositions were not interpreted as reflecting any degree of organization and were scored (0).

C. HEADINGS

1. Each complete original or paraphrased heading was scored (2)

   Damaging Insects = (2) (complete paraphrased)
   Harmful Habits = (2) (complete)

2. Partial or distorted headings may be scored (1)
Harmful = (1) (partial)

3. Headings which paraphrase a macroproposition when no macroproposition is stated receive a score of up to (5). Partial marks may be assigned if the full idea is not present (1 1/4, 2 1/2, 3 3/4).

Warming Living Places = (5) (complete)
Harmful Habits = (2 1/2) (partial)

4. Headings which have no macro or micropropositions beneath them are scored (0).

5. Headings which are accompanied only by inappropriate micro or macropropositions are scored (0).

6. Headings which are accompanied by inappropriate and appropriate propositions are scored according to the above procedures, but only the appropriate propositions are scored. For example:

Termites Live in Nests = (5) (complete)

Termites have lived for millions of years = (0)
They are as small as ants = (0)
Their nests are like cities = (1) (complete)
Each nest has a king and queen = (1) (complete) = 7 (cluster)

(5) (+) 3. Termites live in nests

(+) a) nests are like cities
( ) ( ) b) different termites have different jobs
(+) c) each nest has a king and a queen
( ) ( ) d) they are the parents of all the others
( ) ( ) e) some termites are soldiers
( ) ( ) f) others are workers
1. Few insects have been on earth as long
   a) have existed for millions of years
   b) have hardly changed in that time
   c) about as small as ants

2. Termites are found in warmer parts of the world
   a) Africa
   b) Australia
   c) many parts of the tropics
   d) some live underground
   e) some live in wood
   f) others live in great piles of earth

3. Termites live in nests
   a) nests are like cities
   b) different termites have different jobs
   c) each nest has a king and a queen
   d) they are the parents of all the others
   e) some termites are soldiers
   f) others are workers

4. Change in appearance as they grow
   a) sheds its skin several times
   b) each time it grows bigger
   c) young kings and queens have wings for a short time
   d) use them only once
   e) fly to a new home and lose their wings

5. No matter where they make their nests, termites always do much damage
   a) they eat paper and wood
   b) can eat through a book from cover to cover
   c) can eat tables and chairs
   d) can chew through the walls of a house
   e) they can eat right through a tree
   f) difficult to get rid of termites
Ancient Insects

Few insects have been on the earth as long as termites. They have been around for millions of years. These insects have hardly changed in that time. They have always been about as small as ants.

Natural Environment

Termites can be found in the warmer parts of the world. They live in Africa, Australia and many parts of the tropics. Some termites live underground. Some kinds live in wood. Others live in great piles of earth.

Termites in "Cities"

Termites live in nests that are like cities. Different termites have different jobs. Each nest has a king and queen. They are the parents of all the other termites. Some termites are soldiers. Other termites are workers.

Changes in Appearance

Termites change in appearance as they grow. A termite sheds its skin several times. Each time it grows bigger. Young kings and queens have wings for a short time. They use them only once. They fly to a new home, then they lose their wings.

Harmful Habits

No matter where they make their homes, termites always do much harm. They eat paper and wood. They can eat through a book from cover to cover. Termites can eat tables and chairs. They can chew through the walls of a house. They can eat right through a tree. It is difficult to get rid of termites.
PARROTS TEMPLATE

1. Few birds are as beautiful and interesting as parrots.
   a) More than 700 different kinds
   b) People like them because they can teach to talk
   c) They are also admired for their bright color

2. Parrots are different from other birds
   a) A large beak like a hook
   b) Very strong beak
   c) Uses his beak to help him climb about
   d) Use feet to hold food
   e) Use feet to help climb

3. Parrots live where it is warm
   a) South America
   b) Australia
   c) South America and Australia have the greatest number of different kinds
   d) Many nest in trees
   e) Some nest in cliffs
   f) Still others nest on the ground

4. Pet parrots are kept in cages
   a) Parrots like cages more than other pet birds
   b) Cage should be large enough to move easily without breaking feathers
   c) Cages are made of stainless steel now-a-days
   d) This metal is strong and easy to clean
   e) Sand or gravel should cover the bottom of the cage
   f) Cage should be cleaned once a week

5. Parrots eat nearly anything given to them
   a) Many things are not good for them
   b) May eat some fruit, but not a lot
   c) Mix of seeds and nuts are best food for them
   d) Liquid vitamins should be added to the food
   e) Following simple rules keep parrots healthy
   f) Keep happy for many years
The Parrot Family

Few birds are as interesting and beautiful as parrots. There are more than 700 kinds of birds in the parrot family. People like parrots because they can teach them how to talk. They are also admired for their bright colours.

Different Features

Parrots are very different from other birds. The parrot always has a large beak like a hook. This beak is very strong. The bird uses it to help him climb about. Parrots also use their feet to hold food and to help them climb.

Natural Environment

Parrots can be found in all the warmer parts of the world. South America and Australia have the greatest number of different kinds. Many of them nest in trees. Some nest in cliffs. Still others nest on the ground.

A Parrot's Cage

Of all the birds kept as pets, parrots seem to like cages the most. The parrot's cage should be large enough for him to move easily about without breaking his feathers. Now-a-days most cages are made of stainless steel. This metal is very strong and is easy to clean. Sand or gravel should cover the bottom of the cage. The cage should be cleaned once a week.

Feeding a Parrot

Parrots will eat nearly anything that is given to them. Many things are not good for them, though. They may eat some fruit, but not a lot. The best food for the parrot is a mix of seeds and nuts. Liquid vitamins should be added to the parrot's food. Following these simple rules will keep your parrot healthy and happy for many years.

Name: 

Date: 

Grade: 

Parrots

Parrots Family

There are many kinds of parrots. There are more than 700 different kinds of parrots. Parrots have very hard claws which they use for climbing and holding food.

Special Features

Parrots nest in high altitudes such as cliffs, in tropical trees and on the ground.

Feeding Parrots

Parrots can eat Fruits, but not to much. They like nuts, grains. Vitamins should be added. This will keep your bird healthy, happy for a long time.

Parrots Cage

Pet parrots are kept in cages. Parrots cages should be wide enough so when it flies around no feathers fall off. It should be really really big.

**(Spelling and punctuation are the student's.)**
1. Few birds are as beautiful and interesting as parrots.
   a) More than 700 different kinds
   b) People like them because they can teach them to talk
   c) They are also admired for their bright color

2. Parrots are different from other birds
   a) A large beak like a hook
   b) Very strong beak
   c) Uses his beak to help him climb about
   d) Use feet to hold food
   e) Use feet to help climb

3. Parrots live where it is warm
   a) South America
   b) Australia
   c) South America and Australia have the greatest number of different kinds
   d) Many nest in trees
   e) Some nest in cliffs
   f) Still others nest on the ground

4. Pet parrots are kept in cages
   a) Parrots like cages more than other pet birds
   b) Cage should be large enough to move easily without breaking feathers
   c) Cages are made of stainless steel now-a-days
   d) This metal is strong and easy to clean
   e) Sand or gravel should cover the bottom of the cage
   f) Cage should be cleaned once a week

5. Parrots eat nearly anything given to them
   a) Many things are not good for them
   b) May eat some fruit, but not a lot
   c) Mix of seeds and nuts are best food for them
   d) Liquid vitamins should be added to the food
   e) Following simple rules keep parrots healthy
   f) Keep happy for many years
**Partial Marks Guidelines**

### TERMINES

1. Few insects have been on earth as long as termites. (1)
   - a) have existed for millions of years (1)
   - b) have hardly changed in that time (1)
   - c) about as small as ants

2. Termites are found in warmer parts of the world.
   - a) Africa (1)
   - b) Australia (1)
   - c) many parts of the tropics (1)
   - d) some live underground (1)
   - e) some live in wood (1)
   - f) others live in great piles of earth (1)

3. Termites live in nests. Can be inferred for 1 mark.
   - a) nests are like cities (1)
   - b) different termites have different jobs (1)
   - c) each nest has a king and a queen (1)
   - d) they are the parents of all the others (1)
   - e) some termites are soldiers (1)
   - f) others are workers (1)

4. Change in appearance as they grow.
   - a) sheds its skin several times (1)
   - b) each time it grows bigger (1)
   - c) young king and queens have wings for a short time (1)
   - d) use them only once (1)
   - e) fly to a new home and lose their wings (1)

5. No matter where they make their nest, termites always do much damage (1)
   - a) they eat paper and wood (1)
   - b) can eat through a book from cover to cover (1)
   - c) can eat tables and chairs (1)
   - d) can chew through the walls of a house (1)
   - e) they can eat right through a tree (1)
   - f) difficult to get rid of termites (1)

### PARROTS

1. Few birds are as beautiful and interesting as parrots.
   - a) More than 700 different kinds in parrot fam (1)
   - b) People like them because they can teach them to talk (1)
   - c) They are also admired for their bright colors (1)

2. Parrots are different from other birds.
   - a) A large beak like a hook (1)
   - b) Very strong beak (1)
   - c) Uses his beak to help him climb about (1)
   - d) Use feet to hold food (1)
   - e) Use feet to help climb (1)

3. Parrots live where it is warm (1)
   - a) South America (1)
   - b) Australia (1)
   - c) South America and Australia have the greatest number of different kinds (1)
   - d) Many (nest) in trees (1)
   - e) Some (nest) in cliffs (1)
   - f) Some (nest) on the ground (1)

4. Pet parrots are kept in cages. Can be inferred for 1 mark.
   - a) Parrots like cages more than other pet birds (1)
   - b) Cage should be large enough to move easily without breaking feathers (1)
   - c) Cages are made of stainless steel (1)
   - d) This metal is strong and easy to clean (1)
   - e) Sand or gravel should cover the bottom of the cage (1)
   - f) Cage should be cleaned once a week (1)

5. Parrots eat nearly anything given to them.
   - a) Many things are not good for them (1)
   - b) Hay and straw is great for them (1)
   - c) Mix of seeds and nuts are best food for them (1)
   - d) Liquid vitamins should be added to the food (1)
   - e) Following simple rules keep parrots healthy (1)
   - f) Keep happy for many years (1)
Appendix E: Sources Used in Constructing Instructional and Test Passages
## Sources Used in Constructing Instructional and Test Passages

<table>
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<tr>
<th>Passage</th>
<th>Source</th>
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