5-1997

The Interactive and Combined Effects of Domain-Specific Knowledge and Strategic Knowledge on Reading Comprehension

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THE INTERACTIVE AND COMBINED EFFECTS OF DOMAIN-SPECIFIC KNOWLEDGE AND STRATEGIC KNOWLEDGE ON READING COMPREHENSION

by

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A dissertation submitted in partial fulfillment
of the requirements for the degree

of

DOCTOR OF PHILOSOPHY

in

Psychology

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

1997

ABSTRACT

The Interactive and Combined Effects of Domain-Specific Knowledge and Strategic Knowledge on Reading Comprehension

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Utah State University, 1997

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The literature in reading comprehension has demonstrated that both domain-specific knowledge and strategic knowledge are vital to good comprehension. However, few studies have actually compared the effects of the two types of knowledge on reading comprehension. Fewer studies have examined the effects of combining the two strategies even though cognitive theories indicate that true comprehension occurs when certain procedures act upon knowledge constructed from the text being read and "link" that knowledge with knowledge in the long-term memory.

This study compared subjects receiving strategic knowledge and content knowledge to subjects receiving strategic knowledge only, subjects receiving content-knowledge only, and a control group. Subjects were 9- and 10-year-old students in four fourth-grade classrooms. The design was a pretest-posttest quasi-experimental design. Subjects were given the comprehension and verbal subtests of the Stanford Achievement Test. Based on these tests, subjects were identified as high- or low-ability readers. In addition, they were given a comprehension pretest designed by the

instructor before intervention began. The intervention took place over a 4-week period and consisted of a different series of lessons presented by an independent instructor. After the intervention, subjects took the posttest. SAT subtest scores and pretest scores were used as covariates in the final analysis.

Results showed a decrease in the posttest means and no differences among the four experimental groups. Lack of findings was attributed to several factors, including lack of interest in the reading material on the comprehension tests and brevity of the intervention.

(165 pages)

ACKNOWLEDGMENTS

I would like to thank the elementary school teachers and principals who allowed me to come into their schools and classes and disrupt their schedules. The support received from them was phenomenal and greatly appreciated.

I would also like to thank Lani Van Dusen, who has been my guide through all the intricacies of graduate school (including this dissertation). Thanks to Dr. Kay Camperell, who went the extra mile in guiding my efforts through this process. Thanks to the rest of my committee for their assistance, Drs. Gretchen Gimpel, Blaine Worthen, and Kenneth Merrell.

Finally, a special thanks to my wife, Tammy, whose utter faith and confidence inspired me when my own flagged; to my children, Rachael, Elisabeth, and Kendall, who reminded me of what really matters.

Eric J. Gee

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CHAPTER I

INTRODUCTION

To the cynic, much education seems an exercise in busy work. Few students will be diagraming sentences, dissecting frogs, or creating deductive proofs once they have left the educational system. However, one skill that is crucial to day-to-day functioning is the ability to read. Whether it is reading a newspaper, a highway sign, or the instructions for operating a new fax machine, the ability to understand and comprehend the printed page pervades every aspect of life. This ability has become even more important in the last decade. Much of the information of the "Information Age" is communicated through written materials. Not surprisingly then, educators emphasize learning to read in the early grades and exhibit concern when a child in the upper grades demonstrates his or her inability to engage in that activity.

This problem becomes even more paramount in light of recent statistics on the literacy level of adults in the United States. A national adult literacy survey conducted in 1992 revealed that 47% of the adult population (approximately 90 million people) function at the two lowest levels of literacy (Office of Educational Research and Improvement, 1995). These lowest levels involve being able to locate one or two pieces of information in a question or short text. To function effectively, however, requires more than this ability to recognize information. Fortunately, there are indications that schools are attempting to deal with illiteracy by implementing various innovative methods for reading instruction. Measures of reading performance indicate some improvement over the past two decades among students in junior and senior high school (Office of Educational Research and Improvement, 1995). This is due, in part, to the increased research in the area of reading. Several journals (e.g., Journal

of Adolescent and Adult Literacy, Reading Research Quarterly) are devoted strictly to this issue. Implementation of research findings has led to some improvement in this area.

Successful reading programs have been based on research findings suggesting that content knowledge plays a crucial role in the comprehension of written text. Other studies have focused on the usefulness of learning specific strategies to improve comprehension. Few studies compare these approaches in reading comprehension instruction. In addition, it is not well known what the interactive effects of content knowledge and strategic knowledge are, or if it would be useful to combine both types of knowledge to teach reading. The purpose of this study is to fill this gap in the research literature by investigating these effects--content knowledge only, strategic knowledge only, and a combination of the two.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The past two decades have seen some important discoveries made about the nature of reading (see Van Dijk & Kintsch, 1983). For many years, research has focused on the decoding aspects of reading (Kintsch, 1979). Decoding refers to the ability to recognize the individual words on the page and associate the appropriate meanings with those words (Gagné, Yekovich, & Yekovich, 1993). Researchers now realize that this is only the first step of many in the comprehension process. To actually understand what one is reading requires more than just being able to access the meaning of the word; it requires the knowledge on the printed page to be associated in some way with previously stored knowledge and then incorporated into that store of knowledge (Kintsch et al., 1993). For the purposes of this study, comprehension will be defined as not only understanding the literal meaning of the text but going beyond such literal meanings to achieve more profound understanding of the text (Gagné et al., 1993). To achieve such understanding requires using knowledge the reader already possesses. This process of utilizing prior knowledge to aid in the comprehension of text is called elaboration (Gagné et al., 1993).

The ability to elaborate appears to be one variable that separates the poor reader from the expert reader (Bransford et al., 1982). Recall of text is greatly affected by this capability (Kim, 1992). Gagné's definition of elaboration will be used for the purposes of this review. In other words, elaboration will be defined as the use of already-existing knowledge to aid in the comprehension of text information (Gagné et al., 1993). The

theoretical bases of elaboration will be detailed, followed by a discussion of the instructional methods used to encourage students to elaborate.

Theoretical Aspects of Elaboration

Kintsch's Model

A basic understanding of the reading comprehension process is necessary in order to understand elaboration. One of the best-known and most empirically established theories is Kintsch's theory of discourse comprehension. Kintsch (1986) describes three processes involved in the analysis of a text. The first process involves decoding the linguistic surface representation of the text. This is basically the decoding of individual letters to create words, associating meanings with the words, and analyzing the grammatical position of each word. Others have referred to this process as "decoding" (Gagné et al., 1993) and "syntactic analysis" (Just & Carpenter, 1987).

The second process involves creating a mental representation of the text being read. This mental structure represents the meaning of the text and consists of what is known as microstructures (representations of individual sentences) and macrostructures (representations of summaries of the sentences). The result of this process is known as the "textbase."

Creation of the textbase can lead to the creation of the next level in Kintsch's model, known as the "situation model." The situation model is created when information from the textbase is integrated into existing long-term memory structures. Thus, prior knowledge is brought to bear on the information in the textbase and leads to a coherent representation of the situation of the text.

For example, reading a passage from a novel involves interpreting and understanding the individual words that make up the passage (decoding), representing the meaning of the passage (i.e., what the passage is attempting to communicate [textbase]), and then using prior knowledge to help in comprehending the setting of the passage, which may or may not be explicitly stated (situation model).

As the passage is read, the information is represented as propositions or units of knowledge. Some of these propositions will be retained in short-term memory (STM) to aid in further processing of the information, while the rest of the propositional network is placed in the long-term memory (LTM). Understanding of subsequent sentences depends on the content of those sentences and whether they refer to knowledge pulled from LTM structures or knowledge generated from the text that has been placed in the LTM (Britton, Van Dusen, Glynn, & Hemphill, 1990).

Based upon this model, Kintsch et al. (1993) made a distinction between the recall of a text and learning from a text. When information from a text has been incorporated into the situation model, it has been learned. If it only reaches the textbase level, it may be recalled. But learning, as defined by Kintsch, requires integration of that information with the existing knowledge base (Kintsch, 1988).

Obviously, for reading comprehension to occur, the knowledge base must play an important role. In other words, elaboration must take place. If elaboration is taking place effectively, then a complete and effective situation model of the text information will be created. The questions then become "what does the process of elaboration exactly involve?" and "What kind of knowledge does an individual need to possess in order to elaborate?"

Declarative Aspects of Elaboration

First, the learner needs to have some kind of knowledge base in which to incorporate the text information. The knowledge base or knowledge structures are generally represented as "declarative knowledge" or general knowledge of facts. A certain amount of declarative knowledge is required in order for elaboration to take place (Gagné et al., 1993).

Chiesi, Spilich, and Voss (1979) compared the cognitive processes of a group of subjects with high knowledge in a content area and subjects with low knowledge in a content area. The content area was knowledge about baseball. They had subjects read a passage describing an inning in a baseball game. They then had different subjects engage in a variety of tasks, such as detecting differences between new passages and the old passage, recall of sentences in the passage, picking out the order of sentences in scrambled passages, describing scenes portrayed by the passage, and making inferences about actions in the passage. Their finding was (unsurprisingly) that subjects with greater background knowledge about baseball were more adept at performing these tasks than subjects with little background knowledge.

Chiesi and his colleagues found that high knowledge provides subjects with a better understanding of the game's goal structure and the actions leading to the accomplishment of that goal. High-knowledge subjects will also have better knowledge of the sequence of actions as they relate to the goal. Such subjects used the context of the passage more effectively and had more rapid access to information stored in the LTM.

A later experiment attempted to predict high- and low-knowledge differences in terms of Kintsch's model (Spilich, Vesonder, Chiesi, & Voss, 1979). Recall that microstructures refer to representation of individual sentences while macrostructures

refer to representation of the overall gist of related sentences. Spilich et al. (1979) predicted that differences between high- and low-knowledge individuals' representations should occur within the macrostructure rather than the microstructure. If an equal reading ability is assumed for subjects, then each subject will be able to effectively read and understand each sentence in the baseball passage. However, comprehending the entire passage requires that each sentence be summarized and "hooked" on to the meaning of the succeeding sentence. This requires the formation of the macrostructure. The two components together create the textbase. Recall that for true comprehension to occur, the new information must be integrated into the existing knowledge base (creating the situation model). If an incomplete knowledge base exists, there will be no way to incorporate the information in the passage. Indeed, low-knowledge individuals are stymied at both ends of the process. Without an adequate knowledge base, they will probably be incapable of forming the macrostructure component of the textbase as well as have difficulty in creating the situation model.

Fincher-Kiefer, Post, Greene, and Voss (1988) suggested that greater knowledge improves the processing ability of readers. As mentioned above, when processing text, certain pieces of information will remain in working memory in order to facilitate comprehension of later sentences. Fincher-Kiefer et al. hypothesized that individuals with a great deal of knowledge on a particular subject (hereafter referred to as domain-specific knowledge) have little need to maintain information in working memory. The abundance of domain-specific knowledge allows the individual to provide an extensive and accurate mental model (or textbase) of the information. However, the individual with little domain knowledge must rely more heavily on the text in constructing the

textbase. If the text is inferior, low-knowledge individuals will have even more difficulty in comprehending it (McKeown, Beck, Sinatra, & Loxterman, 1992).

Several researchers have suggested that simply the presence of domain-rich knowledge structures facilitates the reading process and permits elaboration to take place (see Pressley, Borkowski, & Schneider, 1987; Schneider, Korkel, & Weinart, 1990). In other words, very few cognitive resources are used in the elaboration of the information provided by a text. The processing becomes almost automatic when the individual possesses a large amount of knowledge.

Procedural Aspects of Elaboration

However, when "processing" is mentioned (as it has been several times), what does it exactly refer to? Obviously, the facilitating effect of prior knowledge will have a great deal to do with how that knowledge is applied. The usefulness of prior knowledge depends upon the procedures employed to utilize that information (Gagné et al., 1993). These procedures are represented by "procedural knowledge." Procedural knowledge is defined as knowledge of carrying out actions. It is "how to" knowledge. Once information is represented procedurally and practiced, it can be carried out automatically (i.e., without thinking about it).

Other authors have alluded to the importance of procedural knowledge in this process. Chi, Glaser, and Rees (1982) stated that some of the knowledge an expert learner has is procedural.

> We speculate further that the knowledge the expert learner brings to a problem would incorporate a good deal of procedural knowledge—how a knowledge structure can be manipulated, the conditions under which it is applicable, and so on. Novice learners, on the other hand, would have sufficient factual and declarative knowledge about a learning problem but would lack procedural skill; and this would weaken their ability to learn from their available knowledge. (p. 71)

According to the Kintsch model, text information will not be linked with prior information by simply being brought into "conjunction" with one another. This linking requires some kind of processing by the individual. Van Dijk and Kintsch (1983) suggest that this activity can be moved to an automatic state allowing several processing procedures to occur at once. Thus, while reading, working memory contains information about the sentences being read and is also involved in acting upon the information so that it will be placed in the textbase or incorporated into the situation model.

These procedures, often called "strategies" (Alexander & Judy, 1988), contain information about the execution of actions such as skimming, summarizing, and other comprehension activities (Paris, Lipson, & Wixson, 1983). Many times the failure of individuals to comprehend is linked to a lack of nonautomatized strategies (Garner, Alexander, & Hare, 1991; Weinstein, 1978). The literature on the effects of strategies on reading comprehension shows that many strategies result in increased comprehension (Pressley, Johnson, Symans, McGoldrick, & Kurita, 1989).

Interaction of Procedural and Declarative Knowledge In Elaboration

Apparently, reading comprehension does not rely on domain-specific knowledge alone. Though there are some indications that rich domain knowledge will increase comprehension of a text, it is also apparent that there are procedures involved in making connections between the new and old information.

Kintsch (1988) further described this interaction through an explanation of the steps in constructing a textbase. First, propositions are formed that correspond to the text being read. Second, each of these elements is elaborated by selecting a small number of related propositions from the general knowledge store. Third, additional

propositions that are not explicit in the text, nor present in the general knowledge store, are inferred. Finally, the strength of the connections between the newly formed propositions and the previously stored propositions is calculated.

Note that not only is declarative knowledge required (i.e., related propositions from the general store), but a procedure or strategy for selecting those propositions to which the new information will be connected is also required. Alexander and Judy (1988), in their review of the literature, developed several hypotheses about the interaction between domain (declarative) knowledge and strategic (procedural) knowledge. They suggested that a foundation of domain-specific knowledge is necessary for putting strategic knowledge into practice. Strategic knowledge is also vital for the acquisition of domain-specific knowledge. Using strategies inappropriately, or without a good conceptualization of that strategy, will not be helpful in learning and may even be harmful. The more knowledge acquired in a particular domain, the more altered strategic knowledge will be. The content being read, or the task being performed, may determine whether domain-specific knowledge or strategic knowledge is most important for reaching the goal. Increased domain-specific knowledge and strategic knowledge are an attribute of good readers no matter what the domain (Alexander & Judy, 1988).

Current theory implies that both domain-specific knowledge and strategic knowledge are important for successful elaboration in the reading comprehension process. Strategic knowledge can be used to link up the information to appropriate knowledge structures; those knowledge structures consist, in turn, of domain-specific knowledge. On a side note, current theory would also imply that domain-specific knowledge and strategic knowledge are two separate entities or components. As with so many cognitive phenomena, this is probably an oversimplification. However, it is

convenient for purposes of research to consider them separately as have other researchers in the past (see Chi, 1985).

What implications do these conclusions have for the instruction of reading and the improvement of reading comprehension? This question will be considered in the next section.

Improving Comprehension Through Instruction

For theoretical information to be really useful, it must be translated into practice. This section will concentrate on literature dealing with specific instructional efforts in improving reading comprehension. First, the literature regarding the effects of domain-knowledge on comprehension will be surveyed. Next, the literature on the use of strategy instruction for reading improvement will be reviewed. Finally, those articles looking at both domain-specific knowledge **and** strategy instruction will be considered. (For similar reviews see Alexander & Judy, 1988; Lysynchuk, Pressley, d'Ailly, Smith, & Cake, 1989; Pressley & Harris, 1990; Pressley et al., 1989).

Using Prior Knowledge to Improve Reading

As mentioned before, there seems to be some support for the idea that an enriched knowledge base will improve elaboration and, subsequently, reading comprehension. Recht and Leslie (1988) divided 64 seventh- and eighth-grade students into four groups: high knowledge/high ability, high knowledge/low ability, low knowledge/high ability, and low knowledge/low ability. Content knowledge considered here was knowledge of baseball. Ability referred to reading ability. The subjects were given a short passage to read and then asked to (a) summarize the passage, (b) retell it, (c) reenact the passage using wooden figures, and (d) rate the importance of ideas

found in the passage. Recht and Leslie found that students with high ability but low knowledge were no more proficient at the tasks than students with low ability and low knowledge. In addition, students with high ability and high knowledge did no better than students with low ability and high knowledge. Ability was not a factor but knowledge was. Recht and Leslie suggested that the "scaffolding effect" of prior knowledge compensated for a student's lack of reading ability. In other words, prior knowledge provided a structure upon which to "construct" meaning from the text. If the students did not have this structure, then no matter what their reading skill level, they would still have difficulty in constructing meaning.

Schneider and Korkel (1989) divided their subjects similarly; instead of reading ability, however, they looked at aptitude as measured by an IQ test, and their content dealt with soccer. Their subjects were 372 fourth, sixth, and eighth graders. They found results similar to Recht and Leslie (1988). The knowledge of the content seemed to adequately compensate for a student's lack of aptitude. Walker (1987), working with army recruits, came to the same conclusion. It was content-specific knowledge that moved an individual from the status of novice to the status of an expert. She stated that it is very likely that the low-ability students are identified as such because they are assessed in domains with which they are unfamiliar.

Other studies also indicate that high prior knowledge facilitates the comprehension of individuals normally considered to be poor readers. Yekovich, Walker, Ogle, and Thompson (1990) selected subjects with low verbal aptitude scores and from these subjects selected those with a great deal of knowledge about football. These subjects were then given a mock SAT reading comprehension test with passages on football topics. Reading performance for these subjects increased nearly 40%. The poor readers began to perform like average readers.

Since domain-specific knowledge is so crucial to comprehension and other tasks, emphasis should be on teaching the content (Bransford, Vye, Kinzer, & Risko, 1990). However, despite the importance of domain knowledge to reading comprehension, few studies have examined the possibility of using content instruction to improve comprehension. Most studies make use of knowledge bases that subjects already possess.

Using Strategic Knowledge to Improve Reading

When compared with the effects of prior knowledge, the idea that strategy instruction can have important effects on comprehension is not as intuitive. It seems obvious that individuals with more knowledge about content will have better comprehension in reading about that content. However, because many of the strategies used in reading (be they effective or ineffective) are automatic and, therefore, not consciously performed, it is not surprising that their efficacy is largely ignored.

It has been determined empirically that strategies can and do have an effect on an individual's ability to comprehend information. Students who engage in strategic processing have been shown to perform better on reading tasks than students who do not (Alexander & Hare, 1989). Pressley et al. (1989) presented an excellent review of the literature in strategy instruction and found that there are six strategies with strong empirical support in the literature (i.e., summarization, imagery, story grammars, prior knowledge activation, self-questioning, and question answering).

"Summarization" refers to the ability to pick out the main ideas from a passage. "Imagery" refers to constructing representation images of unfamiliar concepts. "Story grammars" are knowledge of how a passage is constructed. Understanding what a

"topic sentence" is or what the "plot" of a story is can aid in comprehension. "Self-questioning" and "question answering" go hand in hand. As individuals read, they ask themselves questions regarding the text and try to answer those self-same questions. This results in a reprocessing of relevant points of the text. The most complex strategy is that of prior knowledge activation. This particular strategy comes closest to illustrating the elaborative process. As readers go through a text, they learn to activate prestored knowledge that would aid in their comprehension.

Menke and Pressley (1994) looked at prior knowledge activation in more detail when they described several studies that demonstrate how students can be led to tie information to prior knowledge. They found that use of this technique generally resulted in more meaningful learning. Wood, Pressley, and Winne (1990) found that readers who use prior knowledge activation learned facts more effectively than students in conditions where such activities were not encouraged. Another study noted that students who are taught to generate precise elaborations (i.e., generation of content related to the content being read) demonstrate better recall of those sentences (Stein et al., 1982). Analysis of the characteristics of successful students has revealed that such students use more meaningful elaboration strategies to understand material as opposed to less successful students whose strategies tended to deal only with superficial aspects of the information (Weinstein, 1978).

Strategy instruction is also effective in training children with reading problems. A study by Walraven and Reitsma (1992) assigned children in two special education schools to an experimental condition where strategies were taught and a control group where children went to regular classes. Results showed higher comprehension scores for the children who received the strategy instruction and that those scores remained higher 4 weeks after the intervention had ceased.

Interaction of Strategies and Prior Knowledge in Improving Reading Comprehension

Pressley, Snyder, and Coriglia-Bull (1987) stated that the knowledge base affects strategic behaviors in three ways. First, the knowledge base may make strategic processing unnecessary. Schneider (1990) found that the improved knowledge base can reduce the need for strategies. Pritchard (1990) found that when reading culturally unfamiliar materials, subjects' use of strategies increased. The more familiar the materials, the less reliance of subjects on strategies (see also Spilich et al., 1979). Second, material learned by relying on the knowledge base stimulates strategy use for incongruent material. Third, the knowledge base makes strategy execution possible. Apparently, the ability to use strategies depends upon the domain-specific knowledge available to the learner (Bransford, Vye, Adams, & Perfetto, 1989; Chi, 1985; Schneider et al., 1990). The conclusion of Pressley et al. (1987) is that strategies and domain-specific knowledge should be taught simultaneously. Walker (1987) also came to the same conclusion. He suggested that since content knowledge has such a powerful effect, one solution would be to teach strategies within the context of specific contents.

Though many researchers have noted that a combination of domain-specific knowledge and strategic knowledge leads to the best performance, there is little empirical research to support this claim (Schneider et al., 1990). Many strategy researchers have ignored the role of domain knowledge (Alexander, 1992). When the interaction between these two types of knowledge is noted, it is usually discussed in terms of the domain-knowledge effect on strategy acquisition, not their combined effects (see Gaultney, 1995; Gaultney & Hack-Weiner, 1993; Willoughby, Wood, & Khan, 1994).

Adams, Bell, and Perfetti (1995) tried to establish an empirical basis for a generalized reading skill. If such a skill exists, then readers can obtain some level of comprehension for a text for which they have little related domain-specific knowledge. However, if such a skill does not exist, then reading comprehension relies heavily on the knowledge the reader has about the content that he or she is reading.

Subjects were placed, based on certain pretest scores, into four groups: high skill/low knowledge, high skill/high knowledge, low skill/high knowledge, and low skill/low knowledge. The knowledge referred to in this case was knowledge about football. Subjects read two texts, one constructed to make high demands on their knowledge about football, the other parallel in structure but requiring no specialized knowledge.

Although subjects in the high skill/high knowledge group performed the best, subjects in the high skill/low knowledge and low skill/high knowledge groups performed equally well. The results indicated that both domain-specific knowledge and general reading skill contributed to comprehension. Apparently, less skilled readers can achieve comprehension of a text that capitalizes on a subject about which they have a great deal of knowledge, while a skilled reader can achieve a level of shallow comprehension even when it deals with a content about which he or she is not knowledgeable.

Woloshyn, Pressley, and Schneider (1992) attempted to investigate the interaction of domain-specific knowledge with strategic knowledge. The strategy being investigated in this study was elaborative interrogation, described as the process of asking questions to help make facts more understandable. Supposedly, this should increase elaborations and inferences made. They were interested in comparing the performance of three groups: (a) readers using the elaborative-interrogation strategy,

(b) readers whose prior knowledge was activated, and (c) readers with no exposure to the materials of interest. They investigated the difference between individuals with and without the appropriate knowledge base. Subjects were 100 undergraduate students--50 from Canada and 50 from Germany (West Germany at the time of the study). Twenty subjects from each country were randomly assigned to one of the two experimental conditions--reading-to-understand and elaborative interrogation. Ten subjects from each country served as the control group and simply took the criterion test. Facts presented concerned Canadian and West German geography. Those in the reading-to-understand condition were presented different facts and told to read each fact carefully. Subjects in the elaborative interrogation condition were given specific "why" questions to answer about each fact presented. During the testing phase, subjects were asked to complete 66 questions by matching the name of the province or state that corresponded with each of the studied facts.

Means of the different groups were analyzed using planned comparisons conducted at an overall error rate of less than .30, which is comparable to the overall Type I rate if a 2x3x2 analysis of variance had been used to analyze the data. Results led the investigators to conclude that elaborative interrogation can increase learning regardless of the status of a subject's domain knowledge. However, effects of elaborative interrogation could be due to activation of prior knowledge. Asking questions facilitates activation of prior knowledge. When prior knowledge is absent, elaborative interrogation increases arousal and attention to facts.

The major limitation of this study (in terms of comprehension) is the reliance upon recall and recognition rather than comprehension in measuring learning. As discussed earlier, Kintsch et al. (1993) makes a distinction between being able to recall information and actually learning the information. While this study does show that

strategic knowledge can work effectively in the absence of prior knowledge, it cannot be inferred that similar processes would take place when engaging in the kind of processing that produces situation models. In addition, the amount of reading that actually took place in the Woloshyn et al. (1992) study was limited to a few independent sentences, not a coherent text. Its application to the area of elaboration and comprehension is, therefore, limited.

Alexander and Kulikowich (1991) attempted to study text comprehension across three distinct populations. Sixth grade students, high school students, and undergraduate students were administered tests measuring their domain knowledge (the domain again being biology), analogical reasoning (the comprehension strategy), and interactive knowledge (testing of biological knowledge via analogical problems). The domain knowledge test was a multiple-choice vocabulary test. The analogic reasoning test was 20 items taken from the Advanced Progressive Matrices (APM). The interactive knowledge test was analogy problems as described in Kulikowich and Alexander (1990). The analogy items were built around the biology vocabulary terms tested in the domain knowledge test. Subjects were then given expository texts to read. One expository passage concerned specifically the body's mechanisms; another passage compared the mechanisms to the PAC-MAN video game. The other passage discussed infection; the supporting analogy passage compared infection to a battle in war. Students read one passage in the nonanalogic form and the other passage in its analogic form. Tests on the expository material consisting of 17 multiple-choice items were then administered.

Scores on domain knowledge, analogical reasoning, and interactive knowledge for the sixth graders were regressed on the text comprehension scores; it was found that all three were significant predictors of text comprehension, accounting for 44% of

the variance in the comprehension of both types of passage. Domain knowledge accounted for the most variance in the nonanalogic passage's comprehension test scores, while interactive knowledge accounted for the most variance in the analogic passage's comprehension test scores. The analogic reasoning test accounted for the least variance due, perhaps, to the fact that it was the only test that did not rely upon content knowledge.

Similar procedures were executed for high school students, the main difference being the use of nonlinear regression rather than stepwise regression, since variable distributions were not normal. For comprehension of the nonanalogic passage, scores on the interactive knowledge test were a significant predictor. For comprehension of the analogic passages, scores on the analogical reasoning test were a significant predictor. The researcher concluded that students use both domain knowledge and analogic reasoning ability to read and remember biology passages.

The final experiment looked at the performance of undergraduates in an elementary education course. Again, the same basic procedures were utilized. The results for both analogic and nonanalogic passages were not significant for any of these predictors. The authors suggested that this may be due, in part, to the small sample size ($\underline{N}$ = 35) or the lack of these students' abilities to integrate analogical reasoning with domain knowledge.

One possible explanation not mentioned by the authors is the accessibility of the biological information. For example, all the high school students were currently enrolled in a biology class. It could be that adequate textbases had been formed that could have facilitated their comprehension of the passages. It is also possible that the sixth-grade students had also recently received some instruction on biology. It is unlikely that the college students, composed of elementary education majors, would

have recently or currently been attending a biology class. Their choice of major might indicate that biological information plays a less prominent role and is not as likely to be incorporated into their LTM structures.

In addition to the theoretical implications, there are also instructional ones. The authors suggest that both content knowledge and strategy knowledge should be taught to students. Teaching both will increase comprehension of all types of texts. However, it should be kept in mind that the authors performed no instructional manipulation. They simply measured strategies and knowledge as were presently constituted in the students. Though the implication is sound, it seems a great leap to go from a statistical conclusion to an instructional one. Use of regression analysis, though informative, cannot establish causality in the same way that actual experimental manipulation of variables can. This is a glaring limitation of all the studies just discussed. There is no attempt to improve the knowledge base of subjects through instruction. Rather, the studies use subjects' existing knowledge bases on a particular subject. Important differences may arise if subjects receive specific instruction on a particular domain.

One recent study that did specifically study the impact of domain-knowledge instruction and strategy instruction on text comprehension was conducted by Greene (1995). Fifty-eight subjects were randomly assigned to one of three experimental conditions: (a) 19 subjects in the domain condition, (b) 20 subjects in the strategy condition, and (c) 19 in the control condition. Domain instruction consisted of a chapter from an economics text. Subjects in the domain condition received instruction via a computer program designed to present background terms. Strategy instruction was also provided by the computer but provided prompts that would encourage question generation, summarizing, and rereading the passage. Subjects in the control

condition were simply instructed to read the text. Results were measured by proportion correct on the two comprehension tests. One was a summary test and the other an inference verification test. An analysis of variance found a significant effect for instruction. Planned contrasts later indicated that though subjects in the two experimental conditions did perform better than subjects in the control, the two experimental conditions were not statistically different from each other.

A modified replication was conducted and discussed in the same study. The same materials were used as well as a similar procedure. The two comprehension tests were modified slightly. Domain knowledge was considered mastered when subjects in that group had completed a seven-item true/false test. The control condition was changed so that subjects spent a similar amount of time as the subjects in the two experimental conditions. Means of the summary test were again analyzed via analysis of variance, which indicated a significant effect for instruction. Planned contrasts showed a significant difference between the domain and control groups only. An analysis of variance on the inference-generation scores revealed no significant differences. The author suggested that the test was easier than the test in the first experiment, and that the instruction was irrelevant.

However, the Greene study is limited for a variety of reasons. First, there appears to be no attempt to assess the acquisition of the strategic knowledge. If the knowledge was not acquired, it is not surprising that no effects for strategy instruction showed up. It would appear that the differences in the first experiment were related to the amount of time spent in going over the materials (that was adjusted in the second experiment). Finally, the study did not combine the two instructional approaches.

In one final study (Dole, Brown, & Trathen, 1996), instruction of strategies was compared with instruction designed to build prior knowledge and traditional instruction

using basal readers. Subjects were 67 fifth- and sixth-grade students. Strategy instruction focused on developing the reader's procedural knowledge to improve text comprehension. The instruction developed was designed to promote self-regulation by teaching readers how, when, and why to activate prior knowledge when reading texts. Story content instruction was designed to enhance the prior knowledge subjects had about a particular topic. This instruction focused on building up declarative knowledge. Instruction in the third group was taken from basal readers.

The instructional texts were all taken from the districtwide basal reading program. Each story taken from the basal reader was selected as the best narrative selection. To assess the comprehension performance of students, six tests were developed covering material from each of the six selections. All questions were open-ended.

The results were analyzed using ANCOVA, since significant differences among the subjects in the three groups on SAT scores were discovered. There was a significant main effect for instruction type. The strategy instruction group scored significantly higher overall than the story content group or the basal control group. There were no significant differences between the story content group and the basal group.

Thus at-risk readers who received strategy instruction achieved higher levels of comprehension than did students in the other two groups. The authors suggested that this may be due to the type of knowledge emphasized by each group. It may also have something to do with the amount of interaction required by students with the texts. Whatever the reason, the superiority of the strategy-instruction approach was nicely established.

One question that could be raised in the previous research is the type of testing used. Strategy instruction, with its emphasis on question generating and summarizing, could allow students to perform better on open-ended questions. Certain styles of instruction may lead to better performance on certain types of tests. Finally, like Greene (1995), these researchers did not combine instructional approaches.

Conclusion

Elaboration has been consistently demonstrated to be a crucial step in the reading process. The use of previously existing knowledge in the comprehension of new knowledge is vital if information read is to be stored in the LTM effectively. Elaboration can be described as requiring two types of knowledge: domain-specific knowledge and strategic knowledge. Many studies have demonstrated the importance of domain-specific knowledge to this process. Other studies have focused on the importance of strategic knowledge to elaboration. There are other studies that attempt to measure the contribution of each type of knowledge to the comprehension process. However, the interaction of these two types of knowledge is not so well documented.

The studies comparing instruction of strategic knowledge with instruction of domain-specific knowledge demonstrate that these types of instruction are better than no instruction at all. Two of the studies did indicate that strategic knowledge can improve comprehension or compensate for lack of prior knowledge (Dole et al., 1996; Woloshyn et al., 1992). However, these studies are limited in respect to either the design used or in the dependent variable they have chosen to measure. In addition, some of the studies were conducted in a highly artificial context. Qian (1993), in a review of content-knowledge studies, noted the research in more natural settings is

required. The same can be said for many of the studies reviewed here with some exceptions (e.g., Dole et al., 1996).

It is interesting that none of the researchers had specifically looked at what happens when strategic knowledge instruction is combined with prior knowledge instruction, though Greene (1995) notes the importance of such a study. Other researchers have also noted that strategies should be taught in conjunction with content (Pressley & Harris, 1990). Yet, there are no studies looking at this very type of instruction. Common sense and reading comprehension theory both support the idea of the two types of knowledge being used in conjunction. However, it may be that only one type of knowledge is necessary to facilitate the use of the other. There is a need for a study that compares the effects of strategic knowledge on comprehension and the effects of domain-specific knowledge on comprehension with the effects of knowledge of both types on comprehension. Such a study would add tremendously to understanding and improving reading.

CHAPTER III

THE STUDY

Purpose

As indicated by the review of the literature, there are several studies comparing the effects of domain-specific knowledge to strategic knowledge instruction. However, most of these studies have subjects use knowledge they already possess rather than providing them with that knowledge. In addition, no study attempted to combine the two types of knowledge and see what their combined effect on reading comprehension might be. This study compared a condition in which both types of instruction were provided to conditions in which only domain-specific knowledge and only strategic knowledge were taught. These three types of instruction were compared to a control condition where no special instruction was provided. This study attempted to answer the following research questions.

1. What are the combined effects of strategic knowledge and domain-specific knowledge on reading comprehension?

2. How does this combined effect compare to the effect of strategic knowledge only on reading comprehension?

3. How does this combined effect compare to the effect of domain-specific knowledge only on reading comprehension?

4. Does this combined effect vary depending upon the skill the reader already possesses?

Finally, instead of using previously acquired domain-specific knowledge, as most studies have done, this study looked at the effects of domain-specific knowledge provided through instruction.

Method

Design

The study utilized a pretest-posttest control group design with three experimental groups and one control group. The experimental groups were labeled as follows: content, strategy, and content plus strategy. Because the study took place within a school, subjects could not be randomly assigned to groups. Intact classrooms were included in each experimental condition. A conversation with the principal of the elementary school selected for the study revealed that classroom makeup was balanced among all classes. In other words, great lengths were taken when assigning students to classes to ensure that each classroom had an equal balance of good, average and poor students.

Subjects

Subjects were eighty-five 9- and 10-year-old students in four fourth-grade classrooms at a Utah elementary school (47 male and 38 female). Permission slips were sent to the homes of all parents and those students whose parents did not give permission were not allowed to participate in the study. In the content-only group, two of the subjects were not given permission and one was dropped from the study because of excessive absences during the intervention period. In the content-plus-strategy group, one student was identified by the teacher as having severe reading problems and went with the teacher for one-on-one tutoring while the intervention took place. In the strategy-only group, one subject was excluded from the analysis (though she participated in the instruction) because she was identified as having severe reading problems. Another student was excluded because of excessive absences. In the control group, one student was not given parental permission and did not take any

of the tests. There were 21 students in the strategy, content, and control groups and 22 students in the content and strategy group.

Fourth graders were used because it was found to be the grade where students stop "learning to read" and begin "reading to learn." O'Donnell and Wood (1992) have stated that students begin concentrating on the content of reading rather than the process of reading during the fourth, fifth, and sixth grades. Because good elaboration requires mastery of the basics of reading, fourth graders were deemed appropriate subjects for the experiment.

The students in each of the four classrooms were grouped according to their reading ability (i.e., good readers and poor readers). This grouping was based on the scores of the comprehension section of the Stanford Achievement Test (SAT). Students who scored 80% or better on the comprehension test were identified as good readers. Students scoring below that percentage were identified as poor readers. This resulted in 46 students being identified as good readers and 39 students being identified as poor readers. A t test was later conducted to determine if this categorization would result in comprehension score differences between the ability groups. The results revealed that the mean difference between the two groups was statistically significant at the .05 level.

Measures

The main measure was a comprehension test based on the selected domain of "economics in Utah history." This domain was selected after conferring with the classroom teachers as the one that would most benefit their classrooms. This test was constructed by the investigator. The pretest form consisted of multiple-choice questions over several different reading passages from several different sources and

across several different domains. Passages were selected based on topic and readability level. Readability was calculated using the Rix Readability Formula (Anderson, 1983). The posttest form consisted of multiple-choice questions over reading passages based on the selected domain (economics in Utah history). Passages on the two tests were matched based on length and readability level using the Rix Readability Formula. The pretest included five passages with readability at the fourth-grade level and four passages with readability at the fifth-grade level. The post-test was constructed in the same manner (five passages at fourth grade and four at fifth grade). Individual readability levels are reported at the end of the passages in the tests contained in Appendix A. Both tests had a total of 50 questions, and students were given one point for each correct question.

To determine the reliability of the two forms, the tests were administered to a fourth-grade classroom at a different elementary school. An alternate-forms reliability index was calculated to be .81. The tests were deemed to be adequately reliable for an alternate forms of reliability index (Crooke & Algina, 1986). Gall, Borg, and Gall (1996) stated that for research purposes, tests with reliability scores of .80 or better are satisfactory.

In addition, the verbal and comprehension tests of the Stanford Achievement Test were administered before the study began. These measures were used as covariates. Raw scores were generated for each student. The verbal test had a possible 30 points, and the comprehension test had a possible 54 points.

Instructional Materials

Lesson plans for each experimental condition were developed by the investigator and pilot tested in a fourth-grade classroom not involved in the experiment. The

purpose of the pilot testing was to judge the efficacy of the plans as well as to provide training for the intervention instructor. No testing was conducted with students participating in the pilot study. However, observations of the instructor teaching the plans were made by the principal investigator. The investigator observed how well the instructor explained the concepts outlined in the lesson plans and maintained class discipline. In addition, students' interest levels and attentiveness were noted during the presentation of the lesson. The lesson plans and the instructor were judged satisfactory based on these observations.

To avoid the effects of different teaching styles in the study, one instructor was selected to teach the three experimental lesson plans. Discussion with the classroom teachers indicated the need for a certified school teacher. Through an advertisement in the local paper, an experienced certified teacher was located. Conversations with former employers were positive about her abilities. During periodic conversations with the classroom teachers during the instruction period, all expressed admiration of her abilities and were comfortable having her in their classroom.

Lesson plans for the strategic knowledge condition were based upon instruction suggested by Pressley et al. (1995). The following reading strategies were emphasized: (a) prediction of upcoming content by relating prior knowledge to ideas already encountered, (b) reacting to text by relating ideas in text to prior knowledge, (c) construction of images representing ideas in text, (d) generating questions in reaction to text, and (e) summarizing text information. The goal of teaching these strategies was to teach students to relate prior knowledge to content being read. In other words, the intervention was designed to improve students' elaboration skills.

Lesson plans for the content instruction were based upon economics in Utah history and emphasized the following topics: industry, mining, agriculture, trading

posts, fur trade, railroad, and economic depressions. The teachers deemed these topics appropriate. This instruction provided the content background thought necessary for students to perform on the comprehension posttest.

The third experimental condition emphasized teaching the above described strategies through use of the above described content. Students were exposed to roughly the same information taught in the other two conditions. For example, students were taught a lesson on summarizing. The students were then given a passage on mining and taught to use the summarizing strategy within the context of this passage. It is important to note that no direct instruction of content occurred in this group; rather content was provided as a context for teaching the strategies. Copies of the lesson plans used are provided in Appendix B.

The control group experienced normal classroom reading activities that normally involve reading a basal reader and completing worksheets associated with that reader. The teacher of the control classroom provided an outline of her activities during the experimental period to demonstrate that the instruction provided was qualitatively different from the instruction provided in the three experimental conditions.

The teachers were interviewed to determine how much of the Utah history curriculum the students had already received. It was found that the teacher of the content-only group had already gone through a unit on Utah history. A review of his lessons, tests, and worksheets found little overlap between those lesson plans and the lesson plans for this study. In fact, there was only one component that the two plans had in common (fur trade). The control group and strategy-only group had just begun their Utah history lessons. Review of those lessons found little overlap. The content and strategy group had not yet begun Utah history lessons.

Lesson plans for each group were reviewed by the teacher of that particular group. The teacher of the content-only group reviewed only the lessons for the content-only group and so on. The teacher for the control classroom saw none of the lessons. All teachers found the lesson plans for their classroom acceptable. References used to construct lesson plans are found in Appendix D.

Procedure

Each of the fourth-grade classrooms was randomly assigned to one of the four experimental conditions. The Stanford Achievement subtests were administered to all four classrooms. The pretest was then administered to all subjects. Instruction took place over a 4-week period. There appears to be no sure statement in the literature about how long the intervention must be. Studies reviewed had intervention periods ranging from a total of 2 hours (Alexander, Pate, Kulikowich, Farrell, & Wright, 1989) to 16 hours (Dole et al., 1996). Practical constraints required that the intervention be only one-half hour per day for about a month. A month of one-half hour interventions provided approximately 6 to 8 hours of instruction.

The intervention instructor was a certified teacher not currently employed by the school district, who came in for 30 minutes each day for 4 days per week. The goal was to provide the students with 8 hours of instruction time. Illness of the instructor and school activities reduced the actual amount of contact time to 6.5 hours.

The instructor was given strict protocols to follow and received training in presenting those protocols during the field testing of the lesson plans. Presenting instruction in this manner helped minimize the effects of teacher personality and skill on the instruction because the instruction for all subjects came from the same individual. To ensure treatment validity, a neutral observer periodically observed the

teaching and filled out a short form indicating the topics covered in that session. Review of those forms revealed that the instructor had not introduced any concepts other than the ones she was assigned to teach. These forms can be found in Appendix C.

After the intervention, the students in all four conditions received the posttest. One student from each class was dropped because of excessive absences during the intervention or inability to complete testing.

CHAPTER IV

RESULTS

Preintervention Group Differences

Before carrying out the analysis of the effects of the intervention, an analysis of preexisting group differences was conducted. Means and standard deviations for scores on the SAT subtests and comprehension pretest for each group are provided in Table 1.

As can be seen in the table, the groups were not equivalent. The control and the content plus strategy group performed better overall than did the strategy-only and content-only groups. One-way ANOVAs were conducted for each of the tests with group serving as the independent variable. The results of these ANOVAs revealed that the differences between groups for the comprehension pretest were statistically

Table 1

Means and Standard Deviations of Preintervention Test Scores for Experimental and Control Groups

	Condition							
	Strategy only		Content only		Content plus strategy		Control	
Test	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD
Reading Comprehension								
Pretest	24.8	(9.2)	25.9	(8.6)	31.5	(11.2)	31.4	(7.8)
SAT								
Comprehension	40.5	(8.8)	36.3	(9.2)	42.9	(8.9)	53.9	(5.4)
Verbal	23.0	(4.4)	23.4	(4.2)	24.7	(4.6)	25.2	(3.4)

significant ($F = 3.1$, $p < .05$). Differences in performance on the SAT comprehension test were also found ($F = 3.6$, $p < .05$). Differences on the verbal subtest were not statistically significant. Post hoc analyses found that these differences were between content plus strategy and strategy, content only and control, content plus strategy and content, and strategy only and control.

Effect size differences between the groups support the assertion of significant preexisting differences. The effect size difference between the strategy-only and content-only groups is small at .10. However, the effect size generated between strategy-only and content-plus-strategy group and the control group is much larger at .60 and .84, respectively. The effect size between the content-plus-strategy group and the control group is negligible (.01), but larger differences exist between content-only and the content-plus-strategy and the control group (.5 and .7, respectively).

The results of these analyses indicate that there are significant preexisting differences among the classes used in this study. These initial differences warranted the use of covariates in the analysis. The use of covariates is intended to ensure that these preexisting differences will be controlled for during the analysis.

Intervention Effectiveness

The effectiveness of the intervention was determined by comparing posttest differences between groups using pretest scores and SAT scores as covariates. The means and standard deviations for both pretest and posttest scores are provided in Table 2.

Decline in Posttest Means

The first notable finding from the results indicated in Table 2 is that the posttest scores are lower than pretest scores. For each group, t tests were conducted, and it was found that only the control group's mean difference was statistically significant (at the .05 level). A careful study of the means indicate that what differences exist in the means of the pretest for each group still exist when examining the means of the posttest for each group.

Although the means decreased for all groups, it was still possible that group differences existed as a result of the intervention. To test this possibility, a 4x2 ANCOVA was conducted on posttest scores using the pretest scores as covariates. The independent variables were experimental condition (strategy only, content only, content-plus-strategy, and control) and ability (high and low). The results of the ANCOVA are provided in Table 3.

Table 2

Pre- and Posttest Mean Scores and Standard Deviations for All Groups in the Study

		Condition							
		Strategy only		Content only		Content plus strategy		Control	
Test	Ability level	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Pretest	High	29.9	(7.8)	30.7	(5.8)	39.2	5.9)	34.3	(4.6)
	Low	19.1	(7.3)	24.1	(8.9)	20.4	(6.8)	22.2	(9.3)
Posttest	High	26.0	(7.0)	28.2	(4.2)	31.9	(8.1)	28.3	(5.8)
	Low	16.0	(6.4)	19.7	(5.9)	16.8	(5.6)	20.4	(4.2)

Table 3

Results of 4x2 ANCOVA Between Posttest Scores and Experimental Condition

Source	SS	df	MS	F
Covariates	829.40	3	276.43	9.18*
Experimental group	32.18	3	10.73	.36
Ability	96.58	1	96.58	3.21
Interaction	31.00	3	10.34	.34
Residual	2227.48	74	11.75	--

*$p < .01$

The interaction between experimental group and ability level was not significant, indicating that the differences in performance between the low- and high-ability students was the same for all experimental conditions. The main effect for ability was also not significant, indicating little difference in performance between all low- and high-ability students on the posttest.

The most important finding is that the main effect for the experimental group was not statistically significant. Regardless of instruction provided, students did not perform differently than those who did not receive instruction. Furthermore, while there were some differences between the scores of subjects receiving the different types of instruction, the overall lack of mean improvement makes it difficult to interpret these differences.

CHAPTER V

DISCUSSION AND CONCLUSIONS

Preexisting Differences Among the Groups

It is important to note that differences existed among the four classrooms before the study began. There are several possible explanations for these differences. Class composition is unlikely to be responsible for the differences because the principal explained that great lengths are taken to ensure that the classes are as equal as possible. The preexisting differences are more likely due to differences in teaching styles among the four classroom teachers. For example, one teacher was described as "running a tight ship." This teacher's students were generally very quiet. The exact opposite existed in another of the classrooms where the teacher's style was much more relaxed. Students were often talking to each other and wandering around in the classroom. These differences become important when later discussing the differences between the four experimental groups.

Lack of Mean Improvement on the Posttest

The first major finding was that all groups performed better before the intervention on the comprehension test than after. This could be an indication that the intervention actually hindered the comprehension process. However, it is unlikely that the intervention was responsible because the control group also had lower scores. The problem was more likely due to the reading material on the posttest used to measure comprehension. The pretest was constructed with a random sample of reading passages from reading books that covered a variety of subjects. The posttest consisted of passages developed specifically for the research covering one topic, Utah

history. It may have been that the passages from the pretest, because of their variability, were more interesting for the students to read. The passages from the posttest may not have elicited as much interest among the students.

Interest may be a key factor in reading comprehension not originally considered in this study. Previous studies (Adams et al., 1995; Woloshyn et al., 1992) attempted to activate prior knowledge; however, none of the studies reviewed took into account the interest the subjects had in the information activated. It stands to reason that if the knowledge was already possessed by the subject, it was knowledge the subject was interested in. Tobias (1994) discussed the importance of the relationship between interest and prior knowledge. He suggested that working on interesting materials leads to deeper cognitive processing. The interest in the topic may have led to the formation of the prior knowledge. In this study, the subject matter was one in which most students may have had no intrinsic interest. However, there was no formal assessment of the student's interest level in the topic. The posttest reading material may not have interested the subjects. Further studies are needed to determine whether interest has an impact or not.

Another possible reason for the lack of mean improvement on the posttest may be related to the reliability of the two tests. While alternative forms of a test with .81 reliability are deemed sufficiently reliable (see Crooke & Algina, 1986; Gall et al., 1996), it still leaves a significant amount of the variance unaccounted for. The scores on these tests account for only 64% of the variance. The unaccounted 36% may have been what led to the findings. At the very least, the amount of unaccounted variance is large enough to suggest the possibility of intervening factors. However, it should be pointed out that the relative differences between groups were similar across both tests, suggesting that the test was reliable. While scores decreased across all four groups,

the differences on the posttest scores were reflective of the differences on the pretest scores.

It is possible that the instructional units were not effective in conveying the information to the students. However, the lesson plans were modeled after empirically based lesson structures described by Pressley et al. (1995). In addition, the lesson plans were reviewed by each of the classroom teachers, the experimental instructor, another teacher uninvolved in the experiment, and two university professors (one experienced with cognitive psychology and the other a reading specialist). While the presentation of the content may have been less effective, it is unlikely that there were any inherent problems in the plans themselves. Their lack of effectiveness could be attributed to the length of the intervention. The lessons were effective; however, students did not have enough interaction time with them.

Other possible reasons for the lack of results could be due to the nature of the subjects. Learning about content through reading is generally still new to fourth graders. Testing of content acquired through reading is also new to fourth graders. It may be that the students were not practiced in taking such tests. In addition, one of the classroom teachers noted that the students seemed to become fatigued while taking the test, and suggested that it may have been more effective to have a short testing period. The researcher noted that students did seem to dread the tests, often greeting his arrival in the classroom with groans of dismay. In addition, while it was not made explicit to the students, many may have realized that the tests did not "count" toward their grade and did not perform up to their usual levels. By the time of the posttesting, students may have tired of the tests and been aware that scores on these tests would not affect their grade.

Lack of Differences Between the Experimental Groups

The second major finding was the lack of statistically significant differences among the four groups. A possibility is that these different types of instruction have no effect on reading comprehension. Given the large amount of literature on the subject, however, such a possibility seems remote. Much of the research done by Pressley (see Pressley & Harris, 1990; Pressley et al., 1989; Pressley et al., 1987) has demonstrated the efficacy of teaching certain strategies in improving reading comprehension. Other researchers (see Chi, 1985; Chiesi et al., 1979; Fincher-Kiefer et al., 1988; Schneider & Korkel, 1989) have shown that prior knowledge definitely affects comprehension and other cognitive tasks.

Failure of Content-Only Group to Improve

Previous studies focusing on prior knowledge have used subjects who already possessed prior knowledge to determine its effects on reading comprehension. This study attempted to teach students information that they did not possess to improve reading comprehension. Subjects in the content-only group were given such information. It may be that the knowledge base for Utah history was not well enough established in the short amount of time the intervention was taught, the result being that the knowledge base may not have been helpful in students' comprehension of the material.

Another possibility is that students had no interest in the material and thus did not learn. The issue of interest was introduced previously. Such interest could have helped in providing the students with more motivation to learn the material. It may be that without motivation, a good knowledge base cannot be established. The

importance of motivation to the learning process has been noted by many researchers (see Brophy, 1988).

In other words, it may be that the content group could not improve their scores, despite the fact they had received content instruction, because the content was not adequately represented in LTM. This failure to represent could be attributed to the short intervention period and the students' lack of interest in the material. Later efforts to rely on that information in comprehending posttest passages may have failed.

Failure of Content-Plus-Strategy Group to Improve

The content-plus-strategy condition suffers from additional problems. The content was not specifically taught, but rather it was presented as context for teaching the strategies. Establishing a knowledge base in conjunction with teaching reading comprehension procedures may overload the STM's ability to process both types of information in a meaningful way. The end result could possibly have been an incomplete knowledge base and only partially learned procedures for reading. In retrospect, it may have been unreasonable to try to establish the knowledge base concurrently with teaching those techniques that help relate the text being read to the individual's previous knowledge. It may be more effective to teach these principles consecutively rather than concurrently. This may have provided a better chance to establish the knowledge base and learn the strategies. Because subjects' prior knowledge was loosely organized and not adequately represented in LTM, significant change may not have been achieved.

To summarize, the content-plus-strategy group suffered some of the same problems as the content-only group. In addition, perhaps an even weaker representation of the information vital to comprehending posttest passages was in their

LTM because so much of the emphasis in their instruction was placed on strategy knowledge.

Failure of the Strategy-Only Group to Improve

The strategy-only group received no content instruction at all. The lack of improvement for this group is harder to explain. One possibility is the brevity of the intervention mentioned earlier. There may have not been time to make use of the strategies automatic. The students may have reverted back to old test-taking habits when confronted with the posttest. A longer instruction period may have produced better results. The teacher of the strategy-only class commented that she felt the students benefitted from the instruction, but only at the end were they actually starting to use the strategies in a meaningful way. More instruction time and more practice for the students would probably have aided the process.

This argument is consistent with other research on the relationship between time and learning. Berliner (1988) noted a relationship between content covered by a teacher and student learning. According to Berliner, this becomes even more important than specific teacher behaviors. It may be that not enough time was spent covering the information on strategies. Learning how to execute strategies, as noted in the literature review, is an example of procedural knowledge. In addition to time spent covering the information, there must be time spent in practicing the strategies for their use to become automatic (Gagné et al., 1993). Anderson (1990) noted that as a sequence of behaviors is performed again and again, the sequence gradually becomes proceduralized. In other words, it requires little processing in the STM to execute the procedure. Since these strategies were taught and emphasized only

during half-hour periods, it is possible that the execution of these strategies did not become automatic.

Conclusions

While both content knowledge and strategy knowledge have been linked to reading comprehension in past studies, the results of this study do not seem to support past research. Posttest scores were lower overall than pretest scores. This may have been due to fatigue of subjects and lack of interest in the reading material on the posttest. There were no differences in comprehension among the four groups. This may be a function of the short intervention period, lack of interest in the content material, and confused presentation of content and strategy information. There is no support in this study for the hypothesis that content-plus-strategy training is more effective than content-only or strategy-only instruction.

The acquisition of reading skills and knowledge may be a more complex process than originally conceived. It may be unreasonable to try to establish a knowledge base with knowledge that the reader has no interest in. It may also be difficult to teach students the appropriate strategies for elaborating on text information in a short time-period. Development of these kinds of skills may require a great deal of practice and instruction.

Limitations

Interest was not measured in this study; therefore, the nature of the role it played in the comprehension process cannot be determined. One possibility is that the interest of the subject in the material being read may determine how much energy the subject invests in the reading process.

The structure of the test and its method of administration may have contributed to the lack of results. A more reliable test may have produced significant results. Students may have performed better with more carefully constructed tests and under different testing circumstances.

Future Studies

One possible alteration of the present study would be to create a more similar pretest and posttest. Such tests may show differences in comprehension or they may simply show that students perform poorly when not interested in the material being read. A couple of approaches could be taken here. First, it may be more effective to design a pretest that requires reading of passages over one subject rather than several. In addition, one subject area should elicit the same amount of interest in students as the Utah history material. This adjustment of reading material on the tests may help make the two tests more similar.

Second, construct a pretest and posttest both containing material in which the subjects are interested. This may be a more effective way of measuring differences among these three types of instruction. Students will be motivated to read the information on the test and perhaps more likely to bring any learned skills or prior knowledge to aid in comprehension of that material.

The findings of this study bring up questions not addressed in previous studies; namely, what is the effect of interest on reading comprehension? The factor of interest needs more careful examination. Most of the studies reviewed here do not take interest into account A study should be conducted that directly studies the impact of interest on the reading process and how it interacts with the factors already explored

here. These would be prior knowledge, strategic knowledge, and the interaction of the two.

More studies comparing these three types of instruction are needed. Additional instruction may be needed to enhance prior knowledge as done by Dole et al. (1996). In that study, researchers relied on prior knowledge of students but provided instruction specifically to enhance that prior knowledge. A study in which all three groups had the same level of prior knowledge, but each received different forms of enhancement of that knowledge, may help avoid some of the pitfalls of trying to establish a new knowledge base with information subjects do not find interesting.

A study in which strategy instruction is presented consecutively with the content instruction rather than concurrently may lead to more striking results. Combining these forms of instruction may not lead to adequate acquisition of either form of knowledge. To avoid overloading during learning, the two forms of instruction may need to be given sequentially rather than concurrently. Separation of these two forms of instruction may help students understand the unique uses of both of these types of knowledge.

Another consideration for future studies is to limit the number of strategies taught during the intervention. It may be that teaching five strategies in such a short time-period did not allow for adequate acquisition of any of the strategies. Better evidence of the effectiveness of reading strategies may be acquired by focusing the intervention on one strategy only.

Finally, to ensure that strategies and knowledge have been adequately learned, some formal assessment of that learning should be made. This test should be administered not only at the end of the intervention period but also at some time

following to assess how well the content and strategy knowledge has been maintained after instruction has been completed.

Implications for Learning

While definitive statements about what the results suggest for classroom practice cannot be made, there are some indications that can be discussed. The issue of interest is an important one. Most teachers intuitively understand that the more interesting the subject matter is, the better their students will learn it. However, not every subject will interest every student. The teacher is faced with the challenge of attempting to engage students in materials they do not find naturally engaging. The teacher then relies on external motivators to encourage students to learn. However, if students do not have some kind of strategies to fall back on when attempting to read a text over material they find uninteresting, the effort can become frustrating for both teacher and pupil.

If the teacher can encourage students to use certain strategies or try to create links to knowledge they already possess, such behaviors on the students' part may still improve learning even over material students are not interested in. Students cannot rely on the vain hope that every book they read will be interesting. However, students can learn how to glean the important information they need by making connections to their previously stored memories with strategies. Research detailing this process and explaining to teachers how to encourage students to engage in these procedures should be of utmost concern to educational researchers.

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APPENDICES

Appendix A

Comprehension Tests

PRETEST

NAME: _____

TEACHER: _____

DATE: _____

Directions: Carefully read each story. Then read each question about the story. Decide which is the best answer to the question. Mark the space for the answer you have chosen. If you need to, you may go back and look at the story.

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Story #1

Esteban sailed to the New World in June of 1527. He was one of six hundred people who were led by a Spaniard named Narvaez. Narvaez had been ordered by the King of Spain to explore all the land from Florida to Mexico. The Spaniards wanted to make the land theirs. They also hoped to find gold.

On May 2, 1528, Esteban began a trip across the New World. Narvaez had heard about a Native American village in the northern part of Florida. It was supposed to be full of gold. Narvaez, Esteban, and three hundred soldiers set out to find it.

For six weeks Esteban and the others walked through swamps, swam across rivers and made their way through thick forests. Finally they found the village they were looking for. But they found no gold.

The Spaniards attacked the village. The Native Americans who lived in the village defended themselves. Esteban and the others were no match for the Native Americans, who knew the land around the village so well. The Spaniards were forced to run for their lives.

For the next six years Esteban and the Spaniards faced hardships. They were still trying to get to Mexico. For a few months they journeyed in five small boats that they had made. Then three of the boats sank in a hurricane, and all the people on board were lost. The other two boats were dashed on shore. Esteban was on one of those boats. He and the remaining Spaniards began to walk.

By 1534, only Esteban and three of the Spaniards were still alive. The rest had been killed or had died from sicknesses. Finally, in 1536, the four men reached Mexico City.

(by Louis Tiadore in Rough and Ready, pp. 136-137) 4th

REMEMBER, ONCE YOU'VE TURNED THE PAGE YOU MAY NOT GO BACK!

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1. The best title for this story is

____a. Esteban's Journey
____b. Spaniards in Florida
____c. The Discovery of Mexico City
____d. The Life of Narvaez

2. Why did the King of Spain send Esteban and the others on their trip?

____a. To conquer the Indians.
____b. To discover Florida.
____c. To find gold.
____d. To find some lost Spaniards.

3. When the explorers found the village in Florida, they were most likely

____a. happy.
____b. pleased.
____c. disappointed.
____d. bored.

4. When Esteban was washed onto shore after the hurricane, it was probably onto the shore of

____a. Florida.
____b. Mexico.
____c. Spain.
____d. Cuba.

5. Why was Narvaez not one of the men who reached Mexico City?

____a. He gave up and returned to Spain.
____b. He probably died along the way.
____c. He probably stayed at the Native American village to mine gold.
____d. He had reached Mexico City before the four men.

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6. These things happened in the story:

1 The Spaniards walked through the forests and swamps of Florida.
2
3 Many Spaniards died during the hurricane.

Which of the following events happened AFTER number 1 and BEFORE number 3?

____a. The Spaniards discover gold in the New World.
____b. The King of Spain sends Narvaez and his men to Florida.
____c. Esteban and his men reach Mexico City.
____d. Many Spaniards are killed by the Native Americans.

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Story #2

Did an insect ever bite you in a spot you couldn't reach? If so, you can understand how miserable even the largest animals are when they are bitten by tiny insects. We think of large animals as having skin too tough to be bothered by mosquitoes and flies. But although their skin is thick, it is sensitive. Fortunately, African animals have friends to help them out.

Red-billed and yellow-billed oxpeckers are often found on buffaloes, rhinos, elephants, antelopes, giraffes, and other plant-eating mammals. These birds ride the backs of large animals, or hang woodpecker-style from their bodies. As they ride, the oxpeckers peck off ticks, leeches, flies, and other pests that bite and sometimes burrow into the skin of big animals. The oxpeckers also scare off insects that might otherwise land.

Oxpeckers would die if they couldn't eat blood that has first passed through a tick. Nearly their entire life is spent on the back of the animal. One of the few times oxpeckers ever leave their host is when they are startled or when they nest.

Oxpeckers have good eyesight and are extremely alert. They are usually the first to spot danger and call a warning. If a host is slow to react to the danger, the oxpecker flies to the animal's head and starts pecking and thumping on its skull.

A similar kind of animal is the remora. The remora is an underwater hitchhiker. It looks like a little shark but has a specially shaped suction cup on the top of its head. When a shark, ray, turtle, or other creature swims by, the remora uses the cup to stick itself onto the larger animal.

As the big fish eats, the remora releases its suction cup and swims alongside, catching and eating scraps of food. The shark also offers the remora protection from predators. It also carries the remora from one place to another. The remora repays its host by nibbling parasites off a fish's skin or barnacles and leeches from under a turtle's flipper.

The remora's suction is so strong that some fishermen put this fish on their lines. As soon as the remora attaches itself to another fish, the fisherman reels both of them in.

(By Susan Sussman and Robert James in Beat the Story Drum, pp. 193-198) 5th

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7. Why do oxpeckers have to eat bugs off the backs of large mammals?

____a. They need blood from insects, like ticks, to live.
____b. There are more bugs than in other places.
____c. Oxpeckers don't know how to fly and can't get to other places.
____d. The large mammals will kill them if they don't.

8. From the passage, we know that how happy a buffalo or antelope is, depends upon

____a. how much grass it has to eat.
____b. how many oxpeckers sit on its back.
____c. how big a herd it lives in.
____d. how thick its hide is.

9. Another name for oxpeckers AND remoras might be

____a. animal friends.
____b. land mammals.
____c. friendly fish.
____d. flying fish.

10. Why would a remora want to stick itself to a shark?

____a. Sharks held keep the remora warm.
____b. Remoras eat sharks.
____c. Remoras eat the shark's leftover dinner.
____d. Remoras want to hide from fishermen.

11. What do remoras do for the animals it sticks to?

____a. It warns the animal of other predators.
____b. It protects the animal from fishermen.
____c. It fights off bigger fish.
____d. It eats parasites off the animal's skin.

12. Why would a fisherman use a remora to fish with?

____a. Because remoras are so tasty to other fish.
____b. Because of its strong suction cup.
____c. Because they are so easy to catch.
____d. Because it likes to wrap itself around other fish.

TURN TO THE NEXT PAGE

Story #3

Television reporters lead exciting lives. On any day they may find themselves assigned to interview famous people, or to travel to distant news sites, or to report on major fires and other disasters. Because news stories can break at any time, TV reporters lead suspenseful lives. They never know when or where their next assignment will be.

Dan Rea loves the reporting life. He's a news reporter for a TV station in Boston. His regular assignment, or beat, as it's called, is the city itself.

You don't have to go to college to become a television news reporter. But there are schools with courses in broadcast journalism all over the United States.

Dan Rea didn't study broadcast journalism in college. Instead, he majored in English and then earned a law degree. While he studied law, Dan wrote a regular political column for a newspaper. Later he hosted a call-in talk show on current events for a radio station. Dan discovered he liked broadcasting. Not long after graduating from law school, he began television reporting. Now his news stories are seen five nights a week by hundreds of thousands of viewers.

The news event most often covered by TV reporters are meetings of one kind or another. At least once a week Dan can expect to be present at some meeting hall in Boston, taking notes, listening, and watching. Because reporters can't describe everything that happens in a meeting, they try to capture the main ideas. Before entering a hall Dan always asks himself, "What is this meeting for?" He then tries to answer his own question.

There are always people to interview. Dan's favorite times are election years because he gets to interview all the candidates. Sometimes, these interviews can be difficult. Candidates don't have much time so you must ask your questions quickly. Dan says that doing interviews has taught him that even famous people are human beings.

(by William Jaspersohn in Rare as Hen's Teeth p. 490) 4th

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13. What would be a good title for this passage?

____a. Studying Journalism
____b. The Life of a TV Reporter
____c. Interviewing Famous People
____d. Getting News Stories

14. What might the paragraph following the last one talk about?

____a. Dan Rea's wife and children.
____b. Other news events covered by Dan Rea.
____c. How to become a politician.
____d. Famous Hollywood stars.

15. How does Dan Rea feel about his job?

____a. His job is very easy.
____b. His job is boring.
____c. His job is enjoyable.
____d. His job doesn't pay enough.

16. What made Dan decide to go into T.V. reporting?

____a. He needed to make more money.
____b. He hosted a call-in talk show on the radio.
____c. He started attending city meetings.
____d. His father was a television reporter.

17. What stories does Dan usually cover as a reporter?

____a. Stories about Europe.
____b. Stories about the city of Boston.
____c. Stories about the United States government.
____d. Stories about Hollywood and movies.

18. Which of the following happened BEFORE Dan found he liked working in broadcast journalism?

____a. He attended lots of government meetings.
____b. He graduated with a degree in broadcast journalism.
____c. He found out he liked interviewing famous people.
____d. He wrote a political column for a newspaper.

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Story #4

The warship *Mary Rose* finally returned home to England on October 11, 1982. It had been gone since July 19, 1545. For over four hundred years, the *Mary Rose* had rested at the bottom of the sea about one mile from the coast of Portsmouth, England.

The *Mary Rose* had been the pride of King Henry VIII's navy. With ninety-one cannons and seven hundred men aboard, the ship had set sail from Portsmouth with other English ships. The English were on their way to battle the French. The *Mary Rose* never made it into battle. It sank about a mile from shore. Only thirty-six men were saved.

No one knows why the *Mary Rose* sank. Some people think the cannons were not fastened to the deck. A strong breeze made the *Mary Rose* lean to one side. Then the heavy cannons rolled across the deck. When the cannons hit the side of the ship, they crashed through. Water rushed through the hole made by the cannons. The ship flooded and sank.

The wreck of the *Mary Rose* was found in 1970 by Alexander McKee. However, at that time he didn't know the name of the ship he had found. In 1971 he and Margaret Rule, who was working with him, were looking at an old chart. They discovered that McKee had found the *Mary Rose*.

When the ship was found, one of its sides was covered with silt. This covering kept the frame and that side of the ship from rotting. From 1971 to 1982 about five hundred divers made thirty-five thousand dives to study the *Mary Rose*. They brought up seventeen thousand artifacts from the ship.

Among the things the divers brought up was a gun that weighed several tons. The gun had been made in 1537. The divers also brought up clothing, games, fishing gear, and a sword.

During the summer of 1982, a team of people prepared to raise the *Mary Rose* from the sea. First, divers dug the wreck out of the silt. Then a large metal frame was connected to the ship. The frame was placed above and around the *Mary Rose*. A week later, the ship and the frame were placed in a metal cradle. The cradle was lined with padding so that it would not damage the ship.

Finally, on October 11, 1982, the *Mary Rose* was brought to the surface. It was loaded onto a barge and then towed to the same dock in Portsmouth where it had been built.

(by May Lewis in Rough and Ready) 5th

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19. Why did King Henry VIII build the *Mary Rose*?

____a. To sail around the world.
____b. To carry cargo to the East Indies.
____c. To win a war against the French.
____d. To conquer Portugal.

20. Alexander McKee knew he had found the *Mary Rose* when

____a. he saw the ship marked on a map.
____b. he brought the ship up to Portsmouth.
____c. he saw the ship's name on the side of the boat.
____d. his friend Margaret Rule described a ship she had found.

21. Why should ships' cannons be fastened to the deck?

____a. It makes the cannons easier to fire.
____b. So they won't be stolen by enemies.
____c. So they won't roll around and damage the ship.
____d. So they won't be lost overboard in a storm.

22. What was the condition of the *Mary Rose* when it was raised from the ocean?

____a. It looked like new.
____b. It only had one side and the frame left.
____c. The sides were intact but the frame had rotted away.
____d. Only the frame was left.

23. Which of the following may have caused the *Mary Rose* to sink?

____a. The ship was attacked and sunk by the Spaniards.
____b. A huge wave knocked the ship over.
____c. Termites got into the wood and made holes in the bottom.
____d. The cannons may have knocked a hole in the ship.

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Story #5

The continent that is farthest south is Antarctica. It is larger than the United States. Yet, until the 1800s nobody had ever seen it.

On January 27, 1820, a Russian sea captain sighted a stretch of ice-covered hills. For several weeks his ship sailed along the edge of the ice. Finally, the captain realized that he had found an "ice continent."

In the next hundred years, people from many countries sailed to Antarctica. Some went to hunt seals and whales. Some went to find out about the life and the land of the coldest place on earth. The following words, written by a sailor, show what the cold was like: "I raised my head to look round and found I couldn't move it back. My clothing had frozen solid as I stood."

In 1898 sailors from Belgium were the first people to spend a winter along Antarctica's coast. During an Antarctic winter the sun disappears for about seventy days. The Belgian ship's log tells how the darkness affected the men: "One seaman had fits...Another went mad with fear...Another died of heart trouble..."

Thirteen years later, men from Norway lead by Roald Amundsen and men from England led by Robert Scott built bases on Antarctica's coast. Both groups planned to be first to reach the South Pole.

During this race to the South Pole, Scott and his men battled high winds, crossed dangerous cracks in the ice, and endured "snow like heavy wet sleet." One of the men wrote: "We are wet through; our tents are wet through...Everything round, on, and about us is wet."

On January 17, 1912, Scott's party reached the South Pole. But the Norwegians had reached the Pole earlier—on December 14, 1911.

Scott and his men died on the trip back to their base. Before Scott died, he wrote: "...feet frozen, no fuel, and a long way from food...We are very near the end, but have not and will not lose our good cheer."

Some good may have come from the deaths of these men. Their brave spirit impressed others who were sent to Antarctica after them.

(by Kathy Kain from Rough and Ready)4th

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24. Which is a good title for this passage?

____a. The Race for the South Pole
____b. Life in the Antarctic
____c. The History of Antarctica
____d. The Death of Robert Scott

25. Why did the Belgium sailors have a difficult time spending a winter in the waters around Antarctica?

____a. They missed their families.
____b. The cold weather was hard to live in.
____c. The constant darkness bothered them.
____d. They ran out of food.

26. Why did people go to Antarctica after it was discovered?

____a. To build homes and live there.
____b. To explore the continent.
____c. To search for gold.
____d. To establish ports for ships.

27. Where were the men who first reached the South Pole from?

____a. Russia
____b. Belgium
____c. England
____d. Norway

28. Traveling to the South Pole was difficult because of all of the following EXCEPT

____a. high winds.
____b. sleet.
____c. avalanches.
____d. ice cracks.

27. What would the paragraph after the end of this passage talk about?

____a. The discovery of Scott's body.
____b. The different animals that live on Antarctica.
____c. The exploration of other parts of Antarctica.
____d. The exciting race to the North Pole.

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Story #6

Some inventors invent things that they themselves need. Then they discover that other people need their invention, too.

Fifteen-year-old Chester Greenwood of Farmington, Maine had a problem with his ears. They were very sensitive to the cold. They would get cold very easily. During the Maine winters, his ears were especially cold. Other children would race sleds down hills, skate on frozen ponds and build ice forts. Poor Chester would rub his ears and go home.

One December day in 1873, Chester decided to do something. He tied a scarf around his head. It itched and would not stay in place. So he decided to cover just his ears. Chester bent a piece of wire into loops. He fitted the loops over his ears and attached them to a hat. Then Chester asked his grandmother to cover them with wool and fur.

When the other kids saw Chester, they laughed. Then they realized that Chester was staying outside longer than he ever had before. Soon the other kids were asking Chester if he would make them covers for their ears.

Soon orders came from all over town. Chester's mom and grandmother were busy helping him make more earmuffs. That was what people were calling Chester's invention. Word of Chester's amazing earmuffs spread to many different parts of New England.

Chester found ways of improving his invention. Instead of attaching the ear covers to a hat, he fastened them to a strip of flat metal. The metal strip was fitted over his head. The band held the ear covers in place.

By the time he was 19, Chester had received a patent for his invention. He became rich and successful. To keep up with the orders, he designed machines to make the earmuffs. He set up a factory in Farmington. Chester went on to make many other inventions. He continued to operate his earmuff factory until he died in 1937.

Today Farmington, Maine, is known as "the earmuff capital of the world." Every year on December 21, the first day of winter, the town celebrates "Chester Greenwood Day." It is to honor a clever boy who found a way to keep his ears warm. He also helped keep millions of other ears warm, too.

(from "Be an Inventor" by Barbara Taylor in Don't Forget to Fly) 4th

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30. Chester invented earmuffs because he wanted to invent something that would

____a. help a lot of people.
____b. make him rich.
____c. keep his ears warm.
____d. make his grandmother proud.

31. Why did Chester start attaching the ear covers to a flat strip of metal?

____a. The ear covers wouldn't stay on otherwise.
____b. So the covers wouldn't have to be attached to a hat.
____c. So that women could wear them as well as men.
____d. To make the building of the ear muffs easier.

32. Chester was rich and successful when

____a. he was ten years old.
____b. he turned twenty.
____c. he was thirty years old.
____d. he died in 1937.

33. Why is Farmington, Maine, called the "earmuff capital of the world?"

____a. Most people who live there wear earmuffs.
____b. It is one of the coldest places in the world.
____c. Chester moved there when he grew up.
____d. It's the location of the first earmuff factory.

34. Why did the children laugh at Chester?

____a. He was always rubbing his ears.
____b. He couldn't come out and play in the snow.
____c. He looked funny wearing his earmuffs.
____d. He always looked thin and sickly.

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Story #7

Tornadoes are made up of the most powerful winds on earth. One tornado tore apart a building that had been built to stand winds of 375 miles an hour. Scientists think that many tornadoes have winds of 500 to 600 miles an hour. Sometimes wind speeds appear to reach 800 miles an hour.

One of the worst tornadoes on record moved forward at a speed of 60 miles an hour. It destroyed trees and buildings along a path three-fourths of a mile wide. The path crossed Missouri, Indiana, and Illinois. It hit in 1925. It killed 689 people. Today, people are warned of coming storms through radio and TV. This helps keep the number of deaths down.

All tornadoes are dangerous. Fortunately, they do not often last more than ten to thirty minutes. They seldom carve a path longer than fifteen miles.

Very strange things can happen inside this path. Buildings blow apart. Windows burst before they are hit. A wheat straw can be driven like a nail into wood. Tornadoes often destroy what they hit. On the other hand, animals, people, or whole houses can be lifted into the winds, carried several feet or miles, and let down again without harm.

People who study the weather have long known something about the way tornadoes begin. A huge amount of dry, cold air pushes against a huge amount of wet, warm air. The warm air rises and begins to whirl. The rising, whirling air forms the tornado.

The rising air inside a tornado acts something like a huge vacuum cleaner. It sucks up everything it touches. However, the power of these rising winds changes from moment to moment. Imagine a vacuum cleaner turning on and off very suddenly. That is how a tornado can lift things in strange ways.

The winds inside the tornado are whirling so fast that there is almost no air at its center. This means that the air inside the tornado is much lighter than the air inside the building. As the storm moves toward a building, the air in the building pushes out. The inside air breaks windows or walls as it rushes outward.

(by Sandra Henneberger in Rough and Ready)5th

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35. Why are fewer people killed by tornadoes nowadays?

____a. Tornadoes don't happen as often as they used to.
____b. Tornadoes aren't as strong as they once were.
____c. Houses are built to stand stronger winds.
____d. People can be warned of tornadoes through radio and TV.

36. How does a tornado start?

____a. Huge amounts of cold air rise very quickly.
____b. Small ribbons of hot air start spinning.
____c. Dry cold air pushes against hot wet air.
____d. A small amount of hot wet air rushes through cold air.

37. Which of the following is TRUE about tornadoes?

____a. Most tornadoes are not very dangerous.
____b. Tornado winds can reach speeds higher than 700 mph.
____c. Most tornadoes last for an entire day.
____d. One of the worst tornadoes took place in 1975.

38. This passage was written mainly to

____a. tell you about towns destroyed by tornadoes.
____b. teach you what to do when a tornado comes.
____c. tell you about different kinds of disasters.
____d. give you a better understanding of tornadoes.

39. Why does the writer compare the tornado to a vacuum cleaner?

____a. To explain why tornadoes lift things in strange ways.
____b. To show how destructive the tornado can be.
____c. To explain why tornadoes leave paths less than a mile wide.
____d. To show why the winds of the tornado blow so fast.

40. How fast do the fastest tornadoes travel forward?

____a. 600 miles per hour
____b. 375 miles per hour
____c. 100 miles per hour
____d. 60 miles per hour

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Story #8

Different people have different ideas about what the first kite looked like. One person thinks the first kite was made from a Chinese farmer's hat on a string. Someone else thinks it was made from a flag. Still another person thinks the first kite was made from an arrow with a string on it.

Most people do agree, however, that the first kites were made in the Far East. Kites have been known there for over three thousand years. Old stories tell of people flying kites in Malaysia. The kites were made of leaves and vine. People in China also flew kites. Some Chinese thought kites could carry away bad luck and sickness. People in Korea believed this too. Kites did not come to the Western World until around 1600.

Long ago, kites were even used in wars and battles. In 206 B.C., a Chinese general wanted to get inside an enemy palace. The only way was to dig a tunnel. First, the general had to figure out how long to make the tunnel. So he flew a kite over the palace. When the kite got over the palace, the general figured out how much string he had used. The length of the kite string told him how long to make the tunnel.

Some people used kites to do experiments. In 1749 two Scots used kites to record the temperature of clouds. They fastened a group of kites together. The first kite had a thermometer on it that fell to the ground when the kite reached a certain height. This made it possible for the Scots to record the temperature of the clouds.

Today kite flying is enjoyed by people all over the world. Kite days are held in many countries. In early spring, people fly kites at fairs all over the United States, in Thailand and in Australia. On May 5th in Japan, children fly kites that look like fish. People there also try to fly huge kites. The kites sometimes weigh as much as a small car. In India kite days are held in January and in July. The people there fly fighter kites. These kites have string that is covered with ground glass. The people who are flying the kites use their kites to try to cut the string of other kites.

Kites have been flown for many different reasons. But today people fly kites mostly just for fun.

(by Martha Weintraub in Rough and Ready pp. 72-74) 4th

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41. In which country do they fly fighter kites?

____a. Japan
____b. India
____c. Australia
____d. Thailand

42. What did a Chinese general use a kite for?

____a. To build a bridge
____b. To figure out how to get over a river.
____c. To measure the temperature of the clouds.
____d. To help conquer an enemy.

43. Which question does the first paragraph in the passage answer?

____a. What did the first kite look like?
____b. When did kites come to the western world?
____c. Where were the first kites made?
____d. What are the different uses of kites?

44. Some people thought kites could be used to

____a. carry people to heaven.
____b. keep people from getting sick.
____c. help crops grow better.
____d. predict the weather.

45. This story was written to tell you about

____a. how to build a kite.
____b. how to fly a kite.
____c. the history of kites.
____d. different models of kites.

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Story #9

In 1962, Rachel Carson was probably the most famous woman in the United States because of her best-selling book Silent Spring which had just been published. Silent Spring warned about the dangers of poisonous chemicals such as DDT that were widely used to kill insect pests. Carson wrote that these poisons were spreading throughout the world—in the air, water, and soil. She wanted everyone to be aware of the dangers of spraying crops and orchards with chemicals.

From an early age, Carson loved nature. Born in 1907, she grew up on a farm in Pennsylvania. At the age of ten, she had a story published in St. Nicholas, a children's magazine. She planned to become a writer when she grew up.

When she graduated from college in 1928, however, her degree was in zoology, the study of animals. She felt that work in the world of nature was more important to her than writing fiction. That summer, Carson saw the ocean for the first time when she did research at the U.S. Biological Laboratory on Cape Cod, Massachusetts. For the rest of her life, Carson was rarely far away from the ocean.

Carson wrote a book about the sea called The Sea Around Us. She won the National Book Award for it. Her next book, The Edge of the Sea, which is about animal life along the seashore, also became a bestseller.

A few years later, one of Carson's friends told her that a plane had sprayed her property with DDT to kill mosquitoes. Ten songbirds had died, she said, noting that she had "emptied and scrubbed the birdbath after the spraying, but you can never kill DDT."

Carson knew she must write about the dangers of pesticides and told fellow scientists that "knowing what I do, I have no choice but to set it down to be read." Years of research, writing, and rewriting went into this book. Carson wanted to be sure she had scientific proof for her statements.

Her book Silent Spring opens in a beautiful fictitious town. When a white powder is sprayed from the sky, the "shadow of death" falls upon the town, and "only silence lay over the fields and wood and marsh." Carson's message was that the destruction of any part of the web of life threatens the human race.

(by Virginia Evarts Wadsworth in Beat the Story Drum pp. 336-339) 5th

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46. A good title for this story would be

____a. Silent Spring
____b. The Dangers of Pesticides
____c. Rachel Carson and the Sea
____d. The Life of Rachel Carson

47. These things happened in the story:

1. Rachel Carson sees the sea for the first time.
2.
3. A friend of Carson tells her about the effects of DDT.

Which of the events below happened AFTER number 1 and BEFORE number 3?

____a. Carson publishes her book Silent Spring.
____b. Carson publishes her book The Sea Around Us.
____c. Carson graduates from college.
____d. Carson publishes a story in St. Nicholas.

48. What might the paragraph following the last one talk about?

____a. Carson's study of animal life along the seashore.
____b. How people stopped using DDT because of the book.
____c. Carson's trip to Malaysia to study the ocean there.
____d. The methods used to make pesticides like DDT.

49. Why did it take Carson so long to write Silent Spring?

____a. She was suffering from cancer and could only write slowly.
____b. She was very busy doing ocean research.
____c. She needed to get a lot of proof about the dangers of DDT.
____d. She had an accident that forced her to give up writing for a time.

50. Why do you think Carson decided to study zoology in college?

____a. Her father wanted her to study zoology.
____b. She loved nature.
____c. She needed to make money to write her books.
____d. She wanted to be an animal doctor at first.

PLEASE STOP

POSTTEST

NAME: _____

TEACHER: _____

DATE: _____

Directions: Carefully read each story. Then read each question about the story. Decide which is the best answer to the question. Mark the space for the answer you have chosen. YOU MAY NOT GO BACK AND LOOK AT THE STORY AFTER YOU'VE TURNED THE PAGE. Answer the questions as best you can and then go to the next story. Remember, as soon as you've turned a page, you may not go back.

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Story #1

One of the first mountain men was Jim Bridger. He discovered the Great Salt Lake. It happened like this. In 1824, several trappers found themselves following the Bear River in Cache Valley. They were curious as to where the Bear River ended. Some of the mountain men made a bet and they sent Jim Bridger to see.

In a small boat made from animal hide, Bridger set off alone on the Bear River. He followed the river through the canyon leading from Cache Valley. After passing through the canyon, he secured his boat to a shrub on the bank near the edge of the stream and climbed out of the canyon. Climbing on the rim of the canyon, he saw the present Bear River Valley. Also, some twenty-five miles to the south, he saw a large body of water. Returning to his boat, he floated downstream to where the river flowed into the Great Salt Lake. He examined the waters and then returned to the camp in Cache Valley. He said, "The Bear River flows into an arm of the Pacific Ocean. I tasted the water and found it to be very salty. It is surely ocean water."

Some people think that others may have been the first to see the Great Salt Lake. A trapper named Provot and his men were attacked by Indians near the Great Salt Lake during the winter. However, Bridger made his way down the Bear River in a boat, which would have happened before the stream froze over. This shows that Bridger reached the Salt Lake before Provot did.

Most people agree that Bridger was the first white man to have seen the Great Salt Lake.

(from The History of Utah, 1540-1886 by Hubert Howe Bancroft , Utah's Heritage by S. George Ellsworth and Utah in Her Western Setting by Milton R. Hunter, p. 47-48.) 4th

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1. The best title for this story is

____a. The Life of Jim Bridger
____b. The Discovery of the Great Salt Lake
____c. The Discovery of the Pacific Ocean
____d. A Trip Down Bear River

2. Why did the trappers send Bridger on his trip?

____a. To find the Great Salt Lake.
____b. To explore Cache Valley.
____c. To see where the Bear River went.
____d. To find the Pacific Ocean.

3. When Bridger saw the Great Salt Lake, he probably felt

____a. excited.
____b. angry.
____c. disappointed.
____d. sad.

4. From reading the story, we can tell that the Bear River

____a. is near the Pacific Ocean.
____b. empties into the Great Salt Lake.
____c. lies south of the Great Salt Lake.
____d. runs through the Canyonlands.

5. Why do some people think that Bridger wasn't the first white man to see the Great Salt Lake?

____a. Because Provot saw the Great Salt Lake around the same time.
____b. Because Bridger later said he made the whole story up.
____c. Because Bridger really discovered the Pacific Ocean.
____d. Because Provot was killed by Bridger near the Great Salt Lake.

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6. These things happened in the story:
   1. **Bridger followed the Bear River out of Cache Valley.**
   2.
   3. **Bridger saw the waters of the Great Salt Lake.**

   Which of the following events happened AFTER number 1 but BEFORE number 3?

   ____a. Bridger and the trappers made a bet.
   ____b. Bridger climbed up the side of the canyon.
   ____c. Bridger told the trappers about the Pacific Ocean.
   ____d. Bridger finds out the water tastes salty.

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Story #2

When settlers first arrived in Utah, they knew nothing about irrigation. They had to learn how to get water from the streams and send it to the land where the crops were growing . The first farmers began using a small stream, which would water the lands of a single farmer or a small group of farmers. Then they started digging large canals and dams which could spread water over a large area.

To help control the water, a man was hired by all the farmers called a water master. The water master measured out the amount of water and the times when farmers could irrigate. Whenever two farmers started fighting over whose turn it was to use the water, they would go to the water master to settle it. The water master would also make sure that the dams and ditches were in good condition.

Under this plan of irrigation, the settlements in the main Utah valleys became prosperous. The pioneers arrived in 1847 to desert that was worthless. By 1850, farmers were growing thousands of bushels of grain, potatoes, and other vegetables!

A major change took place in farming in Utah after 1890. The number of farms and acres of farmed land doubled. By 1920 most of the available land for farming had been claimed. One of the reasons for this was the dry farm.

Utah is known as the birthplace of dry farming in the United States. It was first tried in Utah in 1863 by farmers who plowed and planted "above the ditch," or without irrigation water. Few of these attempts produced crops. Later, methods were developed which were successful.

Here are some of the methods for dry farming. Deep soil must be plowed on the curves of hills to help keep moisture in the soil. Seeds must be planted thinly. The land can only be farmed every other year. Plants grow when there is moisture and nutrients in the soil. Letting the land sit for one year allows the soil to absorb this needed moisture and nutrients.

Between 1912 and 1921, there was a great increase in dry farming. This increased Utah's crop land by one-fourth. These lands produced crops of wheat, oats, rye, barley, and alfalfa.

(from Utah's Heritage by S. George Ellsworth, p. 280) 5th

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7. Why did the first farmers in Utah have to irrigate?

____a. They needed water to drink while they worked.
____b. The ground had to be wet and muddy in order to plow.
____c. There was too much water in the streams.
____d. Not enough rain fell during the year to water crops.

8. Another name for a water master would be

____a. farmer.
____b. water user.
____c. ditch digger
____d. water watcher

9. Why did some farmers want to dry farm?

____a. There was too much irrigation water.
____b. It was better than irrigation farming.
____c. The streams and rivers were drying up.
____d. They wanted to farm more land.

10. What kind of land were dry farmers interested in?

____a. Land near an important source of water.
____b. Desert land.
____c. Land that could not be irrigated.
____d. Land that grew alfalfa.

11. Why could dry farmers only use their land every other year?

____a. They have to irrigate the land the other year.
____b. The land needs the time to absorb water into the soil.
____c. It was too expensive to farm the land every year.
____d. Crops planted on dry farms needed two years to grow.

12. It took about _____ years to increase the farming land in Utah by one-fourth. Which word belongs in the blank space?

____a. five
____b. two
____c. ten
____d. twenty

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Story #3

After the joining of the transcontinental railroad at Promontory Point in 1869, the first branch lines put in were to the mining towns of Utah. These smaller railroad lines linked up with the main railroad lines and often led to other cities, farming areas, and, most importantly, mines. The railroad made the movement of goods easier within Utah. Mine ore could be sent from the mines to the East much more quickly and cheaply than before.

The Tintic Mining District, south of Provo, was formed in the early 1870s. The silver, lead, and gold ore was of such high value that the first mines were successful even with the high cost of moving the ore by wagon. The first railroad that arrived in the district was actually headed toward California. It stopped south of Eureka, a town in the Tintic Valley. Soon a branch was built to Eureka and to another town called Silver City. Trains began moving ore out of the district. The mines there were soon making a lot of money.

Other mining districts soon had branch lines going to their districts. A branch line was built in Iron County to move iron ore from the mines to steel mills in Utah, California, and Colorado. Another line was completed to the silver mines in Ophir.

Mercur was a mining district near Tooele, Utah. Gold and silver were mined there. Mercur owned an interesting railroad line that went from Mercur to Salt Lake City. James W. Neill gave an account of a ride on the Salt Lake and Mercur:

"This railroad is a wonder to the traveler: the trip over it is well worth the taking even if the mining camp at its...end were no attraction...it is twelve miles long and in four miles you can't find a straight rail. It crosses a divide 1800 feet above...reaching this point by a series of curves , loops, twists and turns which fairly make one dizzy...at every turn, the passenger holds his breath for fear this little machine will actually jump over ... the end of the track..."

(adapted from Boom Towns of the Great Basin by Frank C. Robertson and Beth Kay Harris, pp. 111-112 and Utah History Encyclopedia) 4th

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13. What would be a good title for this passage?

____a. The Transcontinental Railroad
____b. Mining in Utah
____c. The Mercur-Salt Lake Line
____d. Branch Lines to Mining Districts

14. What might the paragraph following the last one talk about?

____a. The branch line to the Alta mining district.
____b. Mining iron and lead in Utah.
____c. Building the railroad to California.
____d. Streetcar lines in Salt Lake City.

15. How did James Neill feel about the train ride to Mercur?

____a. The ride was very boring.
____b. The ride was very smooth.
____c. The ride was very quick.
____d. The ride was very exciting.

16. What would James Neill say to other travelers about the Mercur line?

____a. The mining camp is interesting but the ride isn't.
____b. Take a different train to get to Mercur.
____c. The ride is as interesting as the camp is.
____d. Ride a horse or a wagon rather than a train.

17. Which mining district made a lot of money even before trains came?

____a. Mercur
____b. Tintic
____c. Ophir
____d. Iron Country

18. Which of the following happened AFTER branch lines were built to mining districts?

____a. The transcontinental railroad was completed.
____b. Gold was discovered in Tintic Valley.
____c. James Neill rode to Mercur.
____d. Mining became less profitable.

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Story #4

When Franklin Roosevelt became president, he started the New Deal programs to help the people suffering in the Depression. The New Deal programs in Utah were of two kinds. There was direct relief and work relief. Direct relief was money given directly to the unemployed or to fatherless families. Work relief was money earned by doing work on government projects. It gave families a little money to live on.

The Federal Emergency Relief Administration (FERA) was one of the president's first tries at direct relief. It gave out extra goods from the government. It gave out lunches to school children. It also gave part-time jobs to college students and gave some help to drought victims.

The Civil Works Administration (CWA) was one of the first work relief programs in the state. It began in November 1933. The CWA employed thousands of persons in the building of highways, roads, city streets, and sidewalks. The CWA built hospitals, schools, and other public buildings. The building of parks, city water systems, and sewers was also part of this program.

The Civilian Conservation Corps (CCC) was one of the most popular work relief programs. The CCC hired young men in their late teens and early twenties. It placed them in camps away from home. Young men from across the nation were in CCC camps in Utah.

The boys lived in tents. They were treated like they were in the army. The pay was one dollar a day plus food, clothing, and shelter. Most of the boys sent their pay back home.

The CCC boys built roads and trails in the forest. Springs were cleaned and water holes opened. The CCC boys fought crickets, killed rodents, and planted grasses. They built bridges and campgrounds. They helped build dams and rodeo grounds. CCC boys helped build the bird refuge by Brigham City.

Another project was a work program called the WPA for young people who needed money to finish their schooling. The student aid program in Utah lasted from 1933 to 1943. During that time, 3000 to 4000 students had jobs. The hourly wage was small, but the work helped many finish their education. The students would mend and sort library books and do typing for teachers. They also helped repair things on the campus.

(from Utah's Heritage by S. George Ellsworth pp. 315-316) 5th

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19. Why did President Roosevelt set up the New Deal programs?

____a. To help people with little or no money.
____b. To help build statues and other monuments.
____c. To make more money for the government.
____d. To help win World War II.

20. Direct relief was given mainly to

____a. young men.
____b. farmers.
____c. widows.
____d. college students.

21. A person who knows how to design houses would be most useful in which of the following programs?

____a. Civilian Conservation Corp (CCC)
____b. Federal Emergency Relief Administration (FERA)
____c. Civil Works Administration (CWA)
____d. Works Progress Administration (WPA)

22. Why did most of the CCC boys send their money back home rather than keep it?

____a. The government made them send it home.
____b. They had to pay taxes.
____c. They had nothing to spend the money on.
____d. It was sent directly to a bank.

23. Which program provided direct relief rather than work relief?

____a. Civilian Conservation Corp (CCC)
____b. Federal Emergency Relief Administration (FERA)
____c. Civil Works Administration (CWA)
____d. Works Progress Administration (WPA)

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Story #5

Silver was discovered in a place called Silver Reef which is in southern Utah. There was a lot of rock called sandstone in this area and miners knew that silver was never found in sandstone. However, silver was found at Silver Reef.

There have been many stories and legends as to how silver was discovered there. One story says that a traveler noticed drops of silver oozing from a sandstone fireplace while a fire was burning.

Another story about how silver was discovered there is about a man named Metalliferous Murphy. Murphy lived in Nevada and worked as an assayer. An assayer is a person who analyzes rock and tells you if a certain rock has any gold, silver, or other precious metal in it. Murphy often found very rare metals in common stones. Some people thought that he was a fake because he found gold and silver so often.

One day, some miners decided to play a joke on him. A segment of grindstone made of sandstone, used to sharpen knives and other cutting instruments was broken up and taken to Murphy for an assay. He reported that it contained over $200 of silver per ton. Some say he was hanged on the spot. Others claim he was "tarred and feathered and run out of town on a rail." One happy ending of the story is that Murphy traced the original stone where the grindstone was cut to Silver Reef where he went, discovered silver, and became fabulously rich.

However, the truth is that in 1866, a prospector named John Kemple from Montana came to the Silver Reef area. Kemple first found silver in some float material at the bottom of Quail Creek. Float is material that has been washed away from a lode and deposited on the bottom of a stream. When Kemple tested the material, he found it had a great deal of silver in it. However, he could not find where the material had come from.

Finally, he gave up and moved to Nevada for a while. In 1868, he came back and searched for the silver lode again. It was not until 1871 that he finally found a place where he could mine a lot of silver.

(from Silver, Sinners, and Saints: A History of Old Silver Reef, Utah by Paul Dean Proctor and Morris A. Shirts, p. 26.) 4th

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24. Which is a good title for this story?

____a. Metalliferous Murphy
____b. The Life of John Kemple
____c. Silver Discovered in Silver Reef
____d. The Lost Silver Mine

25. Why did miners in the late 1800s doubt that silver would ever be found in Silver Reef?

____a. Because silver had never been found in sandstone.
____b. Because the land was too hard to mine very much.
____c. Because all the silver had been taken out long ago.
____d. Because the Indians wouldn't let them mine in the area.

26. Why did people think Metalliferous Murphy was a fake?

____a. He tried to sell people special bottles of medicine.
____b. He was always drunk.
____c. He claimed to be able to locate gold with a stick.
____d. He always found gold and silver in common stones.

27. Where did Kemple first discover silver at Silver Reef?

____a. In a fireplace.
____b. In a piece of whetstone
____c. In Quail Creek.
____d. At the foot of a large cliff.

28. All of the following are stories about how silver was discovered in Silver Reef EXCEPT the story of

____a. the man who found drops of silver in the fireplace.
____b. the man who chased a sheep into a cave of silver nuggets.
____c. the assayer who kept finding gold in ordinary rocks.
____d. the prospector who found silver in a small stream.

29. What would the next paragraph in the story talk about?

____a. The coming of the railroad to Silver Reef.
____b. The discovery of gold at Silver Reef.
____c. The digging of silver mines at Silver Reef.
____d. The death of John Kemple at Silver Reef.

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Story #6

In the spring, sheep are driven up into the mountains. During the summer they graze there where it is cool and there is plenty of food. In the fall, the sheep are driven back down onto the desert areas. Food is scarce and the animals have to graze over a large area to find enough to eat.

Usually, two men take care of a herd of sheep that may include several thousand head. One man does most of the herding with the help of a horse and one or two dogs. Each day he watches over the hills and canyons. He is careful not to let any of them get away from the herd. If they do get away and are not found, coyotes or other wild animals may kill them.

At night, the herder brings them into the bedding grounds close to the camp. The other man is the camp-tender. He takes care of the camp, cooks the meals, and moves the camp whenever necessary. He also helps the herder part of the time.

During the spring, there is a great amount of work with the sheep. The sheep are sheared. The sheep are brought to a shearing corral. Here men with mechanical clippers cut off their wool. The wool is packed into giant sacks and shipped to the factory to be made into cloth.

Because of the cold winters, beef cattle use both summer and winter ranges. In the spring they are driven up into the mountains. In the fall, the cattle are driven back down into the desert areas. Food is scarce and the cattle have to graze a great deal to get enough to eat. Sometimes, the cattle are carried back and forth in large trucks.

Cattle are generally not tended very closely. They are large enough that they are not bothered by wild animals. For this reason, they are not kept in herds but are allowed to graze wherever they like.

In the spring, the cows begin giving birth to their calves. The calves are weak at first, but soon are walking around and keeping up with their mother. The cows and calves are rounded up and all the calves branded. Then they are driven up onto the mountain or summer range. In the autumn, the cattle are again rounded up and brought back.

Many of the animals are ready for market and are sold. Others are kept as breeding stock, that is, to raise calves to replace those being sold. Still others are kept as feeders. These are kept in a corral or pasture and fed as much as they will eat. In this way, they are soon fat and ready to sell.

(Utah: Past and Present by Willard and Celia Luce, pp. 77-78) 4th

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30. Cattle are not kept in herds like sheep are because

____a. Cattle can protect themselves from wild animals.
____b. Cattle fight with each other too much.
____c. Cattle need more space to graze.
____d. There are fewer cattle than there are sheep.

31. What does a herder do?

____a. Helps move camp.
____b. Moves cattle from one place to another.
____c. Takes care of the dogs and horses.
____d. Keeps sheep from wandering away.

32. When are sheep and cattle driven to the mountain ranges?

____a. fall
____b. winter
____c. spring
____d. summer

33. Why are cattle sometimes moved from one place to another in trucks?

____a. They wander away from the rancher's land.
____b. They run out of food in one area of the range.
____c. They need to be separated from their calves.
____d. They are sent to market to be slaughtered.

34. Sheep are harder to take care of than cattle because

____a. sheep eat more than cattle do.
____b. sheep need at least two men to watch them.
____c. sheep are more dangerous than cattle.
____d. sheep have to be driven to a different range every few months.

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Story # 7

Bingham Canyon was Utah's first mining district and the Bingham Canyon Mine is still producing.

The Bingham brothers, Sanford and Thomas, were the first to discover the rich ores of the canyon. They were sent there by Brigham Young in 1848. They farmed, grazed their herds and turned to prospecting. But Brigham Young advised against hunting for gold. The ore finds were covered and soon forgotten.

Until, a man named Ogilvie picked up a piece of rock while logging in Bingham Canyon. He showed it to an army colonel who found it rich in lead, gold, and silver. Soldiers soon crowded into Bingham Canyon and other nearby areas.

After Ogilvie and others staked the first mining claim, a town grew up. But the high expense of getting ore out of the canyon closed the town down. Placer mining saved the community when men turned to washing ores to find gold. When the railroad came to the canyon, lode mining began again. Mills, smelters, and other plants were built in the early 1870s. For the most part, it was lead and silver mining. At first, copper was not mined much but there came a day when copper became the most important ore mined at Bingham.

The Utah Copper Company began work on the world's first copper pit in August 1906, when its steam shovels began digging away tons of Bingham Canyon. The mine, now a deep pit where a mountain once was, is two and a half miles from one side to the other and is about one half a mile deep. The world's tallest building would reach only half way up one side of the mine.

Five billion tons of material have been removed since 1906. Nearly a third of Utah's minerals come from the copper mine. This mine has yielded more than 12 million tons of copper. This copper is worth more than all the gold mined from the Comstock Lode, the Mother Lode, and the Klondike gold rushes.

The Bingham Canyon Mine was the first open-pit copper mine and is the largest man-made pit in the world. It produces 200,000 tons of copper in a year as well as large amounts of gold, silver, and other minerals.

(from Utah: Unusual Beginning to Unique Present by Wayne K. Hinton, pp. 170-173 and Utah's Heritage by S. George Ellsworth pp. 211-212). 5th

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35. Why did the Bingham brothers stop looking for gold?

____a. They couldn't find any.
____b. The Indians wouldn't let them.
____c. It was too expensive to mine the gold.
____d. Brigham Young told them to.

36. The first people to stake claims in Bingham Canyon were

____a. Mormons.
____b. farmers.
____c. soldiers.
____d. Indians.

37. Which of the following is TRUE about the Bingham Copper Mine?

____a. The digging of the copper pit began in the 1870s.
____b. It also produces gold and other minerals.
____c. It is owned by the state of Utah.
____d. It produces ten percent of Utah's minerals.

38. This passage was written mainly in order to

____a. tell you about copper production in Utah.
____b. talk about open-pit mining.
____c. tell you about the history of the Bingham Copper Mine.
____d. describe mining in the state of Utah.

39. Why does the writer compare the mine's production to different gold rushes?

____a. To show you how much work has gone into the mine's production.
____b. To tell you the different kinds of minerals the mine has produced.
____c. To show you how much the copper mined is worth.
____d. To give you a better understanding of the mine's history.

40. The digging of the world's largest open-pit mine began in

____a. 1848
____b. 1870
____c. 1906
____d. 1948

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Story #8

People in Utah work at many different jobs. Some work for the government. Others work in education. Some people work on farms or in stores. There are many companies in Utah that employ people. One of the largest and oldest companies in Utah is Geneva Steel. It employs around 2000 people, most of whom live in Provo and Orem.

This plant takes iron ore and makes steel by melting iron in large furnaces and mixing it with other metals. The plant was first built during World War II in the 1940s. It made plates and shapes used to build warships. The plant was built near Orem for several reasons.

First, the raw materials needed were close by. There were coal deposits in Carbon County, iron ore from Iron County, and water from a nearby reservoir. The plant was also near major railroad lines. Most of the people working for the plant were well educated and would stay with the company for a long time.

Another reason they built the plant in Utah was that it was far from the coast. The coast could be easily attacked by enemy planes. A plant so far from the coast would not be as easily destroyed.

The United States owned the plant for the first two years after it was built. After the war, Geneva Steel was bought by the U.S. Steel Corporation. However, fewer and fewer people bought steel. Finally, in 1986, the plant was closed. Many people were laid off from their jobs at the steel plant.

Luckily, in 1987, Joseph and Chris Cannon, two brothers, took over Geneva Steel. They were sure that the plant could succeed if some changes were made. The plant reopened in September of 1987. The first big shipment of steel from the reopened plant went to Texas. The next big shipment went to Detroit.

Soon, the demand for steel was so great, that a second blast furnace was put in to help with the steel production. As the demand for steel increased, so did the demand for workers. Many workers who had lost their jobs at the steel plant got them back.

The Cannons plan to increase production of steel and use new processes that will help the plant produce better than other similar steel plants. It will be an important part of Utah for many years to come.

(adapted from Utah: Unusual Beginning to Unique Present by Wayne K. Hinton, pp 174-175) 4th

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41. What was the first steel produced at Geneva Steel used for?

____a. cars
____b. buildings
____c. warships
____d. fighter planes

42. What are the furnaces for at Geneva Steel?

____a. To help keep the plant warm.
____b. To melt iron for making steel.
____c. To melt steel for making aluminum.
____d. To power the machinery of the plant.

43. Which question does the third paragraph answer?

____a. Why did the Geneva Steel Plant close?
____b. Why was the Geneva Steel Plant built in Utah?
____c. Who helped save the Geneva Plant in 1987?
____d. How much did the plant cost to build?

44. Who first owned the Geneva Steel Plant?

____a. the U.S. Steel Corporation
____b. the United States
____c. the Cannon brothers
____d. the state of Utah

45. This story was written to tell you about

____a. the steel-making process.
____b. Utah during World War II.
____c. the construction of the Geneva steel plant.
____d. the history of the Geneva Steel plant.

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Story #9

A railroad company was organized by Brigham Young. This company built a branch line from Ogden to Salt Lake City. The railroad was named the Utah Central Railroad. It was begun on May 17, 1869 and finished on January 19, 1870. Over 15,000 people met in Salt Lake to celebrate when the railroad was finished.

Brigham Young was president of the company. He had the honor of driving in the last spike. He did so with a large steel mallet, made of Utah iron. On top of the mallet was engraved a beehive.

Soon other railroads were built in all parts of the state. Some people called these railways "Mormon Roads." People in southern Utah formed the Utah Southern Railroad Company. It joined with two other companies to form the Utah Central Railway. This railroad covered most of Southern Utah. The Utah Northern Railroad Company built a road from Ogden to Logan. Later, the road went all the way up to Montana.

The building of the railroads in Utah is a good example of the pioneers' ability to work together. Colonel A.B. Carr of the Union Pacific Railroad said:

"The Utah Central is the only line west of the Missouri River that has been built entirely without [help from the government]. It has been built wholly with money wrung from the soil which, a few years ago, we used to consider a desert, by the strong arms of the men and women who stand before me. Everything used in its construction, even the last spike, is the produce of the country."

Later, a railroad company built a road from the southern Utah lines to Los Angeles. The road was completed in 1905. The companies joined to become part of the Union Pacific Railroad.

(From Utah in Her Western Setting by Milton R. Hunter, pp. 248-250) 5th

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46. Which would be a good title for this story?

____a. The Union Pacific Railroad
____b. Utah Railroad Companies
____c. Traveling by Rail in the West
____d. The Northern Utah Railway

47. These things happened in the story:

1. **The Utah Central Railroad built a road from Ogden to Salt Lake City.**
2.
3. **People in southern Utah organize the Southern Utah Railroad Company**

Which of the events below happened AFTER number 1 and BEFORE number 3?

____a. The Northern Utah Railway builds a road to Montana.
____b. The southern railroad companies join Union Pacific.
____c. Brigham Young dedicates the railway by driving in a spike.
____d. Brigham Young organizes the Utah Central Railroad.

48. What would the paragraph after the last one talk about?

____a. The dedication of the railroad tracks at Promontory Point.
____b. The death of Brigham Young.
____c. Traveling to the east by train and stagecoach.
____d. The joining of the Utah Central with Union Pacific.

49. Why did Colonel Carr admire the Utah Central Railroad so much?

____a. Because it had been built without help from the government.
____b. Because the tracks were the best made in the country.
____c. Because the roads went further than any in the country.
____d. Because he liked Brigham Young.

50. Why do you think the Utah railroads were called "Mormon roads"?

____a. Because Brigham Young, a Mormon, owned all the railroad companies.
____b. Because it was the Mormons who first organized and built the roads.
____c. All the roads were owned by the Mormon Church.
____d. All the roads linked up at the Mormon temple in Salt Lake City.

PLEASE STOP

Appendix B

Lesson Plans

Content Lesson Plans
Economics in Utah History

Lesson 1 ECONOMICS

TIME: 2 sessions
OBJECTIVE: The student will gain a basic understanding of the term "economics."

Let's suppose that there is a place far away from Smithfield where no people live. Let's call that place Green Valley.

(Write "Green Valley" on the chalkboard)

Now suppose that one day (name of child in class referred to as "John") discovers Green Valley and decides that it's a great place to build a house and farm. How is John going to survive? Let's list some things that he will NEED to live in Green Valley.

(Write things on chalkboard. House, food, clothing, etc.)(OV1)

John has wood to build a house in Green Valley. It has lots of trees. How is he going to get food? (Grow it, hunt it). Good. But are there some things he can't grow and can't kill? Think of some things that John will need to get somewhere else besides Green Valley.

(clothing, sugar, salt, seeds, glass, dishes, machinery to plant, etc.)

How will John get these things? (buy them) But what will John use to buy them with. There's no stores in Green Valley and John has no money. (He can grow things that he can sell or trade for the things he needs. He'll have to leave Green Valley to get these things.) He goes to Smithfield, say, to get these things.

Now let's suppose that we have (name of child in class referred to as "Mary"). Mary owns a store in Smithfield and wants to build another one. Is Mary going to build her store in Green Valley? (No) Why not? (Because the only person who would buy things would be John)

Now let's suppose that John farming and selling stuff from his farm Smithfield. (Another student in the class referred to here as Mike) sees John selling this stuff at the market and thinks. John has found a really great place. Look at all that stuff he's selling. He must be making a lot of money and buying a lot of things. You see, John has raised so much stuff from his farm that he can buy or trade for everything he needs. So he has all this money left over. Now John can buy some things that he wants. List some things that John might want.

(Things John wants...CDs, toys, nice chairs, nice clothes etc.)

Mike wants these things, too. So Mike decides to move to Green Valley and grow stuff there. The same things happen to Mike that happened to John. He starts out buying

things that he needs and then makes so much money that he can start buying things that he wants. Other people here about it and they move to Green Valley. (Name other kids in class as well as you can)

Pretty soon there are about 100 people living in Green Valley, growing things and going far away to sell them and buy stuff they need and want. Now do you think Mary might build a store in Green Valley? (Yes) Why? (Because there are more people to buy and trade things that she needs). So Mary goes to Green Valley and builds a store. Can Mary run the store all by herself? (No) She needs help so she goes back to the far away place and finds (kid in class referred to as "David'). David moves here to help Mary with the store. Is David farming like the others? (No).

Now some of these people in Green Valley have children. Do you think they might need to go to school? What do they need? (a teacher). A teacher moves into Green Valley to teach the kids. Will the people in Green Valley get sick? (Yes) Now what do they need? (A doctor). A doctor moves into Green Valley. Do you think some of these people might fight or break the law? (Yes) So, a policeman moves into Green Valley. Now we have four more people in Green Valley who don't farm. Name some other people who might move into Green Valley who don't farm (people to fix the machinery, people to build houses, plumbers, etc.)

Let's say Green Valley now has about 200 people living in it. Mary's store is the only store they can go to shop. (Another kid in the class referred to as Bill) has a store and sees Mary's store in Green Valley. Mary is making a lot of money because so many people are shopping there. So Bill decides to build a store. That's because there are so many people there. Of course, Bill will need some help in his store which means that more people will move into Green Valley.

Pretty soon there are so many people in Green Valley that they decide to make themselves into a town. What shall we call the town? (anything they want) So pretty soon we have a town and more and more people move in and the town gets bigger and needs things like people to collect garbage, more policeman, people to help get electricity to all the houses, people to help get water to all the houses. So more and more people move in to Green Valley. With more people you get more stores, more doctors, more teachers, more mechanics which in turn makes the town bigger and bigger and someday, if enough people move in, there might even be a city in Green Valley.

And it all started with John.

This is how a lot of cities and towns developed especially in Utah. It all has to do with buying and selling things. We're going to be talking in the next little while about economics. **Economics** is the study of the way goods and services are made and distributed to people.

Goods are things people sell and buy. Toys, food, tools, cars are all goods. **Services** are also things people do for other people to help them but again the help is sold and bought. Doctors help us buy keeping us well but we have to pay for it. Teachers give you understanding but they are also paid for it. Plumbers fix our leaky faucets and electricians

fix the wiring. They are not giving us an object to keep, they are giving us help we need. At first John needed to buy things to live and then he bought things he wanted. Later, he may have needed a doctor but if a doctor wasn't in Green Valley he would have had to go all the way back to Smithfield for help.

Distributing means getting these things to the people. At first it was hard for John to buy and sell things. Then when more people moved into Green Valley it was easier. People who buy goods and services are called **consumers**. Who here is a consumer? (We all are because we all have to buy things sometimes). How do we buy the things we buy? (With **money**). Money is an important part of history because no one would have stayed in Utah if they couldn't have survived. If they couldn't have gotten the things they need. Many times the way they got those things was through money. Everyone has to make money and if they don't make money in one place they will go somewhere else to make it.

In the next few weeks, we will be talking about the way people who first came to Utah made money. We'll talk about the kinds of things they did to get the things they needed and wanted. We'll see how one person finding a place or a way of making money leads to a lot of people trying to get there to make money and how doing that helped bring lots of different people to our state.

Lesson Two **Fur Trade in Utah**

TIME: 2 sessions
OBJECTIVE: The student will be able to name important individuals in the fur trade and discuss the significance of the fur trade in Utah's history. (OV 2)

Who knows what one of the first goods to be gotten from Utah was? (Fur) Anyone know what kind of fur (mostly beaver) Why would men trap beaver? Did they want the fur? (no) Who did? (People back East and in Europe were buying hats made from beaver pelts.

(OV3)

It's kind of like the way so many people wear baseball caps today. Everyone did it who could afford it. So the reason men came to Utah to trap beaver was what? (Money! They wanted to earn money and they liked doing it this way)

The men who came to Utah to trap beaver were called mountain men. (OV4) Mountain men worked for a fur company. They would trap all year long. Of course, they couldn't take all their pelts with them everywhere they went. So they hid them in different places. These places were called caches. Our valley was probably a place where trappers often cached their furs. Mountain men would meet once a year at the rendezvous. (OV5) The rendezvous is where they would sell their pelts and buy supplies. They would also play games, have competitions, drink, and socialize. Sometimes, it was the only time they would see each other. While they trapped, they would be in danger from wild animals, unfriendly Indians, cold, disease, etc. However, these mountain men were the first explorers and many times it was former mountain men who would lead settlers to establish permanent homes.

Let's try and guess what mountain man slang words actually meant. (OV6 Hide the column on the right)

In 1822, a fur company was formed by William H. Ashley and Andrew Henry in St. Louis, Missouri. (Write their names on the board) It was called the Ashley-Henry Company. They put an ad in the paper that went like this (OV7)

To Enterprising Young Men

The subscriber wishes to engage one hundred young men to ascend the Missouri River to its source, there to be employed for one, two, or three years.

Several people answered the ad. Among them was Jedediah S. Smith (OV8), Jim Bridger (OV9), and John H. Weber. These are names that are still used in Utah. (Smithfield is NOT named after Jedediah Smith, however.) Smith was put in charge of the beaver hunting party.

They traveled West and in the summer of 1824, the party split up. John Weber took some of the men and Smith took the rest. Smith went up to Montana to see what the

British were doing. There were other fur companies besides Ashley-Henry. There was the Hudson Bay Company and the North West Company, both of them British companies. John Jacob Astor, an American, had also formed a fur company. They wanted to each get the best furs for themselves and wanted to make sure others didn't get them. The British especially didn't like the Americans.

Weber, Bridger, and the rest of the party went from Wyoming into Utah. Eventually, they ran into the Bear River and followed it into Willow Valley. Does anyone know where Willow Valley is? (You're living in it. It's now called Cache Valley) Our valley was one of the first places in Utah visited by Americans.

From there, Jim Bridger took some men and continued following the Bear River. Eventually he discovered the Great Salt Lake . He thought it was the Pacific Ocean. Why would he think that? (He tasted the water and it was salty)

Peter Skene Ogden (OV 10) worked for the Hudson Bay Company and was told to go down to Utah and ruin the beaver supply. They thought that if they did this, it would keep the Americans out. At that time, both the Americans and the British claimed the area of Utah as their own. Ogden took a whole bunch of men and went down in 1825 but they were too late. The Americans had beaten them. In fact, Jedediah Smith had been following them closely.

The first rendezvous held by the Ashley-Henry Company was on Henry's Fork of the Green River (Wyoming part of Cache Valley), in July 1825. The next three rendezvous were held here. Twice they were held at Bear Lake and then at various places throughout Utah, Idaho, and Wyoming. At one point, the rendezvous was held over where Hyrum is today.

By1832, they had caught so much of the beavers that there weren't many left. The mountain men moved out of Utah by then. By 1841, the fur trade in all the Rocky Mountain states ended.

REVIEW QUESTIONS (OV 11)

Lesson 3 **Trading Posts**

TIME: **1 session**
OBJECTIVE: **The student will be able to give a basic description of a trading post and its purpose. (OV12)**

I want everyone to put one thing on top of their desk that belongs to them. Now look around at the stuff people have. Is there anything there that you (referring to a specific student) would like to have? What if you traded what you have for what she has? Would that be fair? (Allow the students to talk about trading things. Don't let them actually trade, they can do that later). This is often called bartering (OV13). Trading what you need for something you have.

Remember John? He took his crops and vegetables to Mary's store and traded them for sugar, equipment and other things he couldn't grow on his land. If we wanted to barter, you could trade the object on your desk for something the other persons have.

Would you like this kind of a system? No money to worry about. What are some problems with just trading? (What if Susan doesn't have what Michael wants. She can't get it. But if Susan has something that everyone wants, i.e., money, then she can use it wherever she goes)

Before the white man came to Utah, bartering was an important part of the Native American's economic system. They didn't use money. They took what they had, furs, and traded it for something they needed or wanted like a horse, or a knife

In Northern Utah, there were several trading posts set up but these were set up to trade supplies for furs that mountain men and Indians brought in. When the fur trade disappeared in 1832, so did the trading posts. (Nothing to trade.)

It was different in Southern Utah. In 1868, there were many Navajo Indians living along the San Juan River. They were used to bartering. So men set up trading posts for the Navajo. (OV 14)

The trading post often looked like this: tobacco or candy on the counter inside a guest hogan (A Navajo teepee), an area for people to talk which usually had a stove and counters. In 1890, however, a drought destroyed most of the Navajos' economy and they had nothing to trade. With nothing to trade, the trading posts went out of business.

Until 1900, a fair called the Shiprock fair made the Indians want to show off their goods (remember what goods are?). They began to do rug weaving, and raise livestock and more crops. Between 1900 and 1930, several trading posts were started in the Southern part of Utah mostly in the Southeast corner. Tourists also began coming to see sights like the Rainbow Bridge and Monument Valley (OV 15)

Trading posts were the center of Navajo communities. Sometimes, they were the only other place to go other than home. People often went to the trading post as often to socialize as to do anything else.

As the Navajo became more involved with modern world (cars and other things) the trading posts became less important. By the 1980s most of the trading posts were gone. Why do you think they lasted so long in Southern Utah but not in Northern Utah (because they were an important part of the Indian culture. No reservations in Northern Utah)

REVIEW QUESTIONS (OV 16)

Lesson 4 **Agriculture in Utah**

TIME: **3 sessions**

OBJECTIVE: **The student will be able to describe the main agricultural industries in Utah's history. (OV17)**

Who knows what year the Mormon pioneers entered the Salt Lake Valley? 1847. In 1847. But what did they do when they got here? How did they live? How did they survive? (Farming) (OV18)

Brigham Young, the leader of the Mormon pioneers, wanted them to be farmers. He once said, "We have the good, fine flour, good wheat, horses, cattle, beef, vegetables, fruit, sheep, and wool. This is real wealth. This people is a rich people."

In Colorado, Idaho, Nevada and Montana, most of the people at this time were miners. In Utah, most of the people at this time were farmers.

However, is Utah a wet state or a dry state. (It's a desert state) Does anyone know what the Salt Lake Valley looked like when the pioneers arrived? There was hardly anything green except for two or three cottonwood trees. Mostly it was covered with sagebrush and ground crawling with black crickets. It must have seemed very depressing.

So how could they grow anything in the desert? There was a small river called City Creek flowing in the valley. They dug a small ditch from the creek to water the first crops planted there, potatoes. This was the first example of irrigation in Utah. Irrigation is moving water from where it usually flows to the place where we need it. Irrigating became extremely important because nothing will ever grow without water.

Many of the crops grown in Utah are watered with irrigation water. In other parts of the United States, they don't have to move sprinkler pipe or build irrigation ditches. They get enough water from the sky. However, we don't get very much. So water is very important. The way water gets to crops nowadays is much more complicated.

The irrigation system developed in this way: (Draw on the board)

1. several small irrigation ditches were dug from creeks flowing from the mouths of canyons. The water belonged to everyone and everyone could use it.

2. After a while, the government started deciding who would get the water and when. Water no longer belonged to everyone but belonged to each person individually. They had to use the water when it was there and when it all dried up or when their turn to use it was over, they couldn't use it anymore.

3. Then came bigger irrigation projects, like building dams. People often build dams to provide irrigation water for farmers.

Another way of growing crops without water was called dry farming. When you dry farm, you only plant special crops that don't need as much water (like wheat for example), you also take care of the soil in a special way to make sure that it keeps as much water as possible. Because you don't get as much wheat as you do from an irrigated piece of land, dry farms are often very big. Today, 50% of the land used for growing crops is dry farm.

The person who came up with the idea of dry farming is John Widtsoe (OV 19) who worked at Utah State University. Today, many dry farms exist in other Western states but it was a man from Utah who came up with the idea.

Here are some of the crops grown by the early Mormon settlers: wheat, corn, oats, potatoes, peas, beans, rye, and barley. Some of these are still grown in Utah today; in addition, alfalfa is also grown.

Early pioneers brought many kinds of fruit with them, apples, peaches, cherries, pears, apricots and grapes. In the 1860s, down in Washington County (near St. George) they tried growing grapes for making wine. But it didn't last very long. So most of the fruit grown wasn't for selling, it was just for the people who grew it. It wasn't until 1903, that people started trying to grow fruit to sell.

Who can tell me what the three main fruits grown in Utah are? (apples, peaches, cherries)

Who can name me the two places where most of this fruit is grown? I'll give you a hint on one of them. I'll bet some of your moms or dads went to this place buy fruit last summer. (Box Elder country i.e. Brigham City. The other place is Utah County, Provo)

(If possible get a hold of a sugar beet for demonstration purposes)

There was another crop grown in Utah that was very important. In fact, for about 100 years it was probably the most important crop grown in Utah. Anyone know what it is? (Have someone come up to the front and put a little sugar on their tongue) What is it? (Sugar!) Did you know that sugar was made here in Utah at one time? Where does sugar come from? (Sugar cane.) But there's one other place we can get sugar from. It's from a vegetable called the sugar beet. Sugar beets were an important crop in Utah for a long time. (OV20)

Mormon church leaders first tried to manufacture sugar from sugar beets in 1850 but weren't successful. In 1889, they formed the Utah Sugar Company and built a beet sugar factory in Lehi. Conditions in Utah were just right for growing sugar beets. They also had a lot of boys to thin, weed, and harvest the beets, as well as many men to work in factories.

Soon there were seventeen factories in Utah, and many more factories in other parts of the West. (OV 21) Ogden became a major headquarters for sugar companies.

Why aren't there any sugar factories around anymore? What happened?

Two main things:

1. A little fly called the beet leafhopper invaded during the 1920s and destroyed many of the crops.

2. The cost of producing beet sugar was greater than the cost of producing cane sugar. People will buy the sugar that costs less because it tastes basically the same. (OV22)

(If possible, get some examples of beet sugar and cane sugar to taste)

One of the larger sugar companies, Amalgamated Sugar still has its headquarters in Ogden but no sugar beets are grown in Utah. However, there are still beets grown in Southern Idaho and Oregon.

What other agriculture product is raised in Utah? (livestock, cows, sheep) (OV23)

Mormon pioneers brought livestock with them. But none of them had big cattle ranches.

However, in the late 1870s, the raising of long-horned cattle and some of the practices associated with it began to be used in central Utah. This was known as the Texas invasion. That was because most of this breed came from Texas originally. Eventually, there were about 500,000 head of cattle in Utah for many years.

Along with cattle, sheep were also raised. By 1885, there were a million head of sheep in Utah. This increased to about 2 million head of sheep for many years afterwards.

What do cattle and sheep eat? Grass

Ranchers would simply let their cattle and sheep loose in different areas for long periods of time. The cattle and sheep would eat the grass that grows naturally. Of course, if you have too many cattle and sheep eating for too long a time in one area you get what is called **overgrazing**. Which means that so much grass is eaten that no new grass gets a chance to grow back. So you have go other places. Lack of grass can cause problems.

There are still a lot of cattle and sheep raised in Utah. There is other livestock as well such as pigs and goats. Poultry like turkeys, chickens are also raised.

Dairy cows are also raised in Utah. There used to be several milk companies here in Cache Valley that needed milk. There's still Gossner's cheese, which requires dairy cows. So especially, in Cache Valley, the dairy industry has been very important

The other big agriculture business in Utah was the canning industry. In fact, the main counties were canning took place were Davis, Weber, and Cache country (our own

county). Does anyone know what the main vegetable canned were? Mostly peas and tomatoes but they canned a lot of other things as well.

For many years, people would can things in bottles not in cans. I'll bet some of your mothers and grandmothers still can things in bottles. So when people started canning things in cans, a lot of people wouldn't buy them because they were used to seeing fruits and vegetables in bottles.

A man named Alexander McKinney started a canning company called the Ogden Canning company in Ogden. Robert Lundy started the Utah Canning Company which was also located in Ogden. They started their companies back in the 1880s. They canned things like tomatoes, ketchup, peas, corn, pumpkins, string beans, plums, apples, berries, peaches, etc. So we've had canned foods for over 100 years. We've had ketchup for 100 years, too! There were a lot of other canning companies. There were companies that canned milk here in Cache Valley as we mentioned before.

However, there aren't any canning companies left in Utah. We used to have the Del Monte cannery here in Smithfield but it only made cans, it didn't can anything. And the Del Monte cannery in Franklin that did can things recently went out of business. There used to be a lot of canning companies in Utah and now there aren't any.

REVIEW QUESTIONS OV24

Lesson 5 **Mining in Utah**

TIME: **3 sessions**

OBJECTIVE: **The student will be able to name the major minerals mined in Utah and discuss the impact of mining on Utah's history. (OV 25)**

Brigham Young didn't want the Saints to mine. Remember he considered the riches to be agricultural. But eventually, he did encourage some mining. However, mining didn't become a major industry until the 1860s.

In 1862, Colonel Patrick E. Connor arrived in Salt Lake Valley with his soldiers. Many of these soldiers were former prospectors. These are people who go looking for different minerals to dig up and sell. What do you think these soldiers went looking for? (Silver and gold).

In 1863, the first formal claims were staked (This means that the person who staked the claim was the only person who could dig there) in Bingham Canyon. Some men found silver there. Other claims were made near Tooele and Salt Lake City. Soon there were several mining districts all over the state

Mining activities increased with coming of the railroad in 1869 (we'll talk about this later) and really increased in the early 1900s.

Some of the richest mining districts were near Tooele, Salt Lake City, in the Escalante Desert, near Park City and Alta, and near Nephi. (OV 26) Some of these mines are still working today. (OV27)

The mining towns were different than the Mormon towns. First, miners put up tents. Then came slightly stronger buildings. These buildings were all over the place. There was sometimes only one street. Had a boarding house, store, blacksmith shop, livery stable, meat market, saloons, dance halls, and a cemetery. (OV 28)

Let's talk about some of the different things that were and are mined here in Utah

(OV29)

From 1850 to 1870 coal was mined in many places throughout Utah. The richest deposits of coal, however, were found in Sanpete County and near the foot of Book Cliffs in Grand County on the east side of Utah

Who used coal? What was it for? It was used for heating. Used for furnaces. But the main user of coal was the RAILROAD. WHY? Because that was the fuel railroads used in those days. They didn't have gas. They burned coal to get the train to move.

World War II caused an increase in the demand for coal. However, in the 1950s and 60s there was again little demand for coal until the 1970s when the Arab oil embargo resulted in electric companies using coal to generate electricity. However, presently, there is again little demand for coal.

(OV30)

(OV31)Who knows what mineral Utah is BEST known for? (Copper)

Bingham Canyon had rich deposits of gold, silver, zinc, and copper. These were discovered in the 1870s. Bingham Canyon would not become famous for copper until the early 1900s.

In 1910, several different copper companies were merged to form the Kennecott Copper Corporation. Many immigrants moved into the Bingham area in the 1900s to work the copper mines.

During World War II, it was said that the copper mine supplied one third of all the copper used in the war

Towns such as Magna and Copperton were created as a home for the miners. The techniques for mining copper are called open-pit mining. You can see the Kennecott Copper mine from the Interstate if you are driving to Provo. Ask your mom or dad to show you where it is. It is a huge mine that still operates today . We can see it on our photo of Utah. (OV32)

Silver and gold mining in Utah has not been as important an industry. But Utah does have gold and silver. Bingham canyon where the copper was mined had some gold, too.

The most famous gold-mining town in Utah was Mercur. It was located in the southern Oquirrh Mountains (locate on map)

The gold in Mercur mines was difficult to extract; and then in 1893, a new process was discovered to extract the gold and eventually the mine produced around 4 million dollars worth of gold.

However, the town experienced a fire that practically destroyed it in 1902 and the mine was not as profitable and Mercur died. However, gold is still being mined in Mercur Canyon quite a bit of it.

Silver has been mined in many places---Park City, Alta, Bingham Canyon, Frisco, Eureka.

One famous boom town was Silver Reef. Silver was discovered there by John Kemple in 1866 but he couldn't find the source of the silver vein.

In November of 1875, Silver Reef was named and sprang up very quickly. Many of the silver mines were developed. Chinese laborers moved in and set up their own Chinatown. Between 1878 and 1882 there were six mills in operation averaging a million

dollars of silver a year. However, the mines closed in 1884 because too much silver was being produced throughout the world and it wasn't as valuable as it once was. And the mines started filling with water. Silver Reef is now essentially a ghost town.

One other mineral which is or was important in Utah is uranium. (OV33) Does anyone know what uranium was used for (nuclear reactors, atomic bombs, etc.)

Uranium was a waste product of vanadium mines. However, at the end of World War II, the government was looking for uranium and sponsored a mineral rush. The first big uranium strike in the nation was made by Augustus Steen near Moab in 1952. Several uranium mines developed. Quickly, Moab became the Uranium Capital of the World. However, the Atomic Energy Commission got enough uranium stored up and stopped buying in 1970.

Mining changed a lot of things in Utah. You didn't really have millionaires until mining started and then those people who owned the mines got really rich. Mining also brought in a lot of different people to Utah. Irish, Welsh, Japanese, Mexicans, Chinese people from a lot of different countries. It also brought in a lot of people who were not Mormon.

REVIEW QUESTIONS (OV 34)

Lesson 6 **RAILROADS**

TIME: **2 sessions**

OBJECTIVE: **The student will understand the impact of the coming of the railroad to Utah on Utah's economy and history.(OV 35)**

The coming of the rail road to Utah was one of the most important events in its history. (OV36) It connected Utah with other parts of the United States. It made it easier to move goods and people to different parts of Utah and different parts of the United States. Helped move out valuable mining products. In fact, mining did not become a major industry UNTIL the railroad came to Utah. It also helped ship out agricultural products to different parts of the country. People could sell their products

Travel was made much easier with the railroad. For the first pioneers to come to Utah it took 100 days to get from the Missouri River to the Salt Lake Valley. A handcart company made it in 90 days. A wagon company in 80 days. A stagecoach in 14 days. The pony express in 6 days and the railroad in one and a half days. (Might be good to write this on the board. Ask them which they would rather travel in)

People in Utah wanted the railroad. So one company started building the railroad in California(Central Pacific Railroad Company). Another company started building from Omaha Nebraska (the Union Pacific Company) around 1862. (OV37 show on map) It would be transcontinental meaning that it would go all the way across the entire United States. This was important because before you had to go by stagecoach or by boat all the way around South America.

It took a long time because you could only lay about four to seven miles of track a day. Chinese workers worked on the railway from California. Mormons helped build the railroad once it came into Utah. The railroad came through Ogden and joined the other railroad 50 miles northwest of Ogden. (OV38)

One of the most important events then in U.S. history and Utah history was the driving of the golden spike marking the completion of the transcontinental railroad on May 10, 1869 at Promontory Point. (Show on map) (OV39)

It signaled the end of the pioneer era and much of the Mormon influence in Utah.

After this was completed, a railroad was built between Ogden and Salt Lake City, linking this city to the transcontinental railroad. This was completed in 1870 and was called the Utah Central Railway. It was built by volunteer Mormons (didn't get paid). It brought farm produce of farms and ores from mines from Salt Lake to Ogden and from there to other markets. It also carried passengers. (OV40)

During the 1870s, more railroads were built from SLC to Sandy, Lehi, American Fork, Provo and further south in Beaver County. The Utah Northern Railroad was organized in 1871 to send farm goods and other supplies to mining towns in Montana. It ran from Brigham City to Mendon, Logan, and Franklin. A passenger could leave Ogden at

9:40a.m. and arrive in Logan at 12:50 p.m. and in Franklin at 2:24 p.m. That was about 20 miles an hour with stops. The Union Pacific built the railroad the rest of the way into Montana. That was probably pretty amazing for people back in those days.

Another important line was a railroad between Salt Lake City and Denver that was established in 1883. This provided some competition for the Union Pacific Railroad. It meant people could choose which railroad line to use to ship freight or to ride.

Streetcars were built in SLC, Provo, Ogden, and Logan around the 1880s and 90s. The first street car was a car drawn by four horses on tracks that ran down the center of SLC's wide streets. There were three streetcar lines in Logan with one running from Utah State University clear down to the railroad on the west side of town. These streetcars stopped running around 1915. However, SLC had streetcars up until 1946.

(Show laminated article from Herald Journal, read what might be appropriate from it.)

Railroads are not as important as they used to be. WHY? (Paved roads, buses, cars, airplanes.) Still important in moving goods and people (Amtrack).

The railroads meant that more goods could come to Utah and they wouldn't be as expensive. It meant that Utah could export or send its goods to other cities. It changed the way people sold and bought things a great deal. It made Ogden and SLC important centers of transportation and industry, and it's one reason those towns are so much bigger than other cities. It brought a lot of people into Utah who were not Mormon and meant that the LDS Church did not have as much power as it used to. And it improved the agriculture industry (dairy and canning, especially) and the mining industry.

REVIEW QUESTIONS (OV 41)

Lesson 7 **Manufacturing**

TIME: **1 session**

OBJECTIVE: **The student will explain the difference between raw goods and manufactured goods and describe the state of manufacturing in Utah's history. (OV42)**

Let's look at two terms: **raw goods** and **manufactured goods**. (OV43, 44) manufactured goods are products that come out of factories, like radios, t.v's, cars, furniture. Raw goods are those things from which manufactured goods are made. For example, what raw good do you need to make a chair? (wood) How about a car? (metal). When we talk about manufacturing, then we mean the production of manufactured goods from raw goods.

Utah does not produce as much manufactured goods as they do raw goods. During the middle 1800s, very little manufacturing went on. Mostly people produced raw goods and shipped them to factories in the East. However, remember that Brigham Young wanted the early pioneers of Utah to be self-sufficient. To do that, they had to learn how to make some of the things that they needed. So manufacturing got off to a better start than in most of the other Western states.

Early manufacturing met the needs of people living in Utah. Shoe and leather production, iron products, furniture, lumber, and other wood products. However, when the railroad came into Utah in 1869, many local companies suffered. Manufactured products from the east could be bought. However, other companies flourished by sending their products to other places to be sold.

However, manufacturing in Utah did not really take off until World War II. Because of the war, manufacturing started developing in all parts of the West, including Utah. Some of this manufacturing was started by individual people. Sometimes, the government would set up a factory to produce something. That was the case with Geneva Steel (OV 45)

Geneva Steel is a large steel plant down near Provo. After the war, it was bought by U.S. Steel Corporation. However, in 1985, it was closed. It was then bought by local Utah businessmen and reopened. It now employs about 2400 people.

There are other major manufacturing businesses in Utah. There are three companies that manufacture missile parts and rocket engines. They are Unisys, Hercules Corporation, and Thiokol Corporation. Maybe some of you know people who work at Thiokol. It's a large plant that manufactures parts for missiles. Another company is McDonnel-Douglas. They manufacture airplane parts.

Two other important companies manufacture software for computers. Novell and WordPerfect Corporations. They became one company in 1994. REVIEW (OV 46)

Lesson 8 **Panic of 1893**

TIME: **½ session**

OBJECTIVE: **The student will be able to describe the Panic of 1893.**

(OV 47)

This was a national financial crisis. It began on May 4, 1893. A lot of banks and businesses went out of business. So many people didn't have jobs and weren't buying anything. So the people who sold stuff couldn't sell their stuff and they went out of business.

In Utah, it was worse because the price of land was high and the winter before had been severe enough to damage the crops. So farmers who bought a lot of goods didn't have the money to buy things. So again, many banks and stores went out of business, leaving more people unemployed.

However, Heber J. Grant, who would become a president of the LDS Church, worked to keep two banks open, Zion's and the State Bank of Utah. This helped make the depression not so bad. Eventually, Utah emerged from the depression, but it took nearly six years.

The important point was that Utah was no longer independent of the rest of the United States. Events that took place in other parts of the U.S. could affect Utah.

Lesson 9 **The Great Depression 1929-1940**

TIME: **½ session**

OBJECTIVE: **The student will describe the impact of the Great Depression on Utah.** (OV48)

During the 1930s, all of the United States went through what is now known as the Great Depression. It was a lot like the Panic of 1893 but much worse and lasted longer.

Let's first look at what happened. On October 24, 1929, the Stock Market crashed which resulted in hundreds of banks closing their doors, thousands of businesses going out of business, and millions of people losing their jobs. Those who still had jobs found their salaries cut. Farms went out of business because of drought which only made the situation worse. In 1931, 20,000 people committed suicide. People often went hungry as did their children. Those who had money could buy a lot. A new home was less than $3,000, a new suit was less than $10, a shirt around 50 cents. A loaf of bread was a nickel, a pound of steak 29 cents, and new shoes around four dollars.

The situation was worldwide not just in the United States.

Utah was hit very hard by the Depression. Thirty-five percent of the people in Utah were unemployed. Farmers could find no one to buy their crops. Thirty-two of Utah's 100 banks failed. Business failures increased 20%.

More women joined the work force. Women who stayed at home would "use it up, wear it out, make it do, or do without." They would buy day-old bread, reline coats with old blankets, save string, old rags, and wire, watch every penny, and fear that some catastrophe would wipe out the family budget. Maybe some of your grandparents went through the Depression and would remember what it was like. Maybe some of them still save plastic bags, string, etc., just in case. It was a difficult time to live. (OV49)

When Franklin D. Roosevelt (OV 50) was elected president, he set up the New Deal programs. These were programs designed to provide work for unemployed and hopefully get people buying things again. Building roads, sidewalks, sewer systems, many federal buildings, art works. Following the programs, the Mormon Church established its own Welfare Program in 1936.

However, the Depression did not end until the start of World War II. During the war, when so many different products were needed, the Depression was finally over.

REVIEW QUESTIONS (OV51)

Lesson 10 **Review and Assessment**

TIME: **1 session**

OBJECTIVE: **The student will review the major points from the lessons previously given.**

NOTES:

STRATEGY LESSON PLANS

Introduction

How many of you like to read? (Wait for response)

What kinds of books do you like to read? (Responses)

How many of you like to read math books? Social studies books? Books about horses?

Let's look at two passages. (OV1 OV2 Ask a student to read one passage and another student to read the other passage. Take the overheads down)

Who can tell me what the first story was about?

Who can tell me what the second story was about?

What did the boy in the first passage want more than anything?

What kind of rock comes from volcanoes?

How old was the boy when he got "puppy love"?

What are "sediments"?

Which one did you like the best? Why?

Some books are a lot more fun to read than others. When you're in school, though, you have to read a lot of things that you don't really like to read. I'm going to be talking to you, in the next few weeks, about ways to help you read books and chapters that maybe you don't like to read very much. It's easy to read the stuff we like but harder to read what we don't like. But it's very important that we try to read everything as well as we can.

We are going to talk about five different strategies for reading. A strategy is like a tool. What do we use tools for? (To help us put things together). A strategy is something that helps you read and understand better.

These are the five different strategies (OV3)

Imagine
Question
Think
Predict
Summarize

We will spend some time talking about each one of these strategies and we'll also give you time to practice these strategies. By the time you're done, if you use these strategies, you will all be expert readers!

However, you must remember one thing. Remember the first time you tied your shoes or played a piano piece? Were you good at it right away? NO! Practicing strategies takes time. When you first start doing these strategies, you won't be good at it and you'll have to read very slowly to do them. But if you keep practicing them and doing them, soon you'll read just as fast as you did before.

FIRST STRATEGY

Imagine

OBJECTIVE OF LESSON

The first strategy we want to look at is IMAGINE! One good way to understand and remember what you read is to make pictures in your mind. We will practice making pictures in our minds to help us understand and remember what we have read.

INFORMATION ABOUT WHY

Sometimes pictures are easier to remember than words. Name a movie that you've gone to see or a video you watched recently. (Allow children to respond) Which is easier to remember, a movie or a book? Or a movie and a page from your math textbook? Because pictures are sometimes easier to remember than words, then to make up a picture about what we are reading might make it easier to remember what we've just read.

INFORMATION ABOUT WHEN/WHERE

It's easy to make up pictures when reading a story. Especially, if the story already has pictures in it. But we can make up pictures no matter what we're reading. Even if it isn't a story.

INFORMATION ABOUT WHAT/HOW

Let's take a look at HOW to do it.

Let's take a simple sentence

(OV4) "The little gray mouse was running away from the scary black cat." (Hand out blank sheets of paper) I want everyone to draw a picture of this sentence. (After completed, collect them and show some as examples) You all created a picture of the sentence in your head and drew it on paper.

So as you read a sentence, you start trying to make a picture in your head. You say to yourself, "What would this mouse look like? What would the cat look like?"

MODELING

Now I will read a sentence and draw a picture on the board as I read the sentence

(OV5)

Mary Ann rode her bicycle down to the drugstore to buy some milk.

(Draw a picture on the black board of the sentence)

Now, I'll take a longer passage and try to draw a picture as I read the passage.

(OV6) Passage

(Draw appropriate pictures to illustrate the passage)

(OV7) Now let's do it with a harder passage, one that's not a story.

(Draw pictures of trash or stuff underground, the sun and wind etc.)

No matter what I'm reading I can still draw a picture to show what it is.

PERSONAL EXPERIENCE

Relate a personal experience where the use of IMAGINE has helped you understand something you read.

GUIDED PRACTICE

Let's take three sentences and one by one draw a picture for each.

(After they've finished, compare pictures and let students know that it's not how good they picture it, but the fact that they are trying to draw a picture. It also doesn't matter what they draw as long as it is a good reflection of what the sentence is about.)

(OV8)

Now let's go through some paragraphs. One of them will be stories and one will be a passage that's not really a story.

(Let students read the passage)

(OV9, OV10,)

Now on these last passages, I want you to read it and draw a picture IN YOUR MIND. Not on a piece of paper. You're not always going to be able to draw, so it's better to be able to do it in your mind.

(OV11, OV12)

(Have the students tell about the pictures that they imagined)

SECOND STRATEGY

QUESTION

OBJECTIVE OF LESSON

IMAGINE helped us think about what we are reading. Another strategy which helps us to think while we're reading is QUESTION. The questions we ask ourselves as we read can help us understand better. They can also help us know when we don't understand. Let's take this sentence for example.

Jennifer was completely mesmerized by the movie.(OV13a)

Was there anything in that sentence you didn't understand? (Mesmerize)

So a questions we might ask ourselves as we go through and read is "What does mesmerize mean?" (Ask a few students to respond. What do they think "mesmerize" means. Finally define mesmerize as "to hypnotize" or "to make someone really interested")

INFORMATION ABOUT WHY

When we ask questions as we read, it makes us more aware of what we do and don't understand. If we just read quickly, without thinking about it, we might miss information that's important. Asking questions makes us stop and think about what we are reading.

INFORMATION ABOUT WHEN/WHERE

Anytime we are reading a paragraph, a sentence, or a story or a chapter, we should try and ask ourselves questions as we read. Especially if we don't understand what we just read. We should stop and ask ourselves why we didn't understand it.

INFORMATION ABOUT HOW

First, there are different kinds of questions that we can ask ourselves.. There are "memory" questions and there are "thinking" questions. Memory questions are questions that simply repeat what you have just learned. Thinking questions mean that you don't just repeat what you've learned, you start thinking about it in a new way.

The best kinds of questions to make up are thinking questions.

(Give them a handout of the things below OV 13b)

Here are some different thinking questions you can ask yourself.

Describe _____ in your own words.
What does _____ mean?
Why is _____ important?
Explain why....
Explain how...
How are ___ and _____ the same?
What is the difference between _____ and _____?
How does _____ affect _____?
What are the strengths and weaknesses of _____?
What causes _____?
How could _____ be used to _____?
What would happen if _____?
How does _____ tie in with what we learned before?

These are the kinds of questions we should ask ourselves as we read.

MODELING

I'll read through a couple of passages and generate THINKING questions as I do. I'll write my questions on the board and after I have finished reading try to answer them. If I can't answer them all, explain that maybe I need to read a little more information and then I'll find the answers to my questions. (OV13c)

(Ask yourself some of the above described questions after reading the passage about chimpanzees)

(Go to OV14 and go through the same process)

PERSONAL EXPERIENCE

Relate a personal experience where question generating helped you understand something you read.

GUIDED PRACTICE

I will pass out two passages for you to read. After you read each passage, I want you to write down the questions below the passage that you think are important. These should be thinking questions. If you need to, look at the handout with the different questions on them. (OV 15 and 16)

(Have some students read their questions. Make sure they are thinking questions. After that go through and try to answer some of the questions.)

EVALUATION

After you have generated your questions, you should ask yourself these three questions to determine if they were good questions.

How well did I pick out important information?
How well did I link the information together?
Can I answer my own question?

(Go through some of the questions generated by the students and ask these questions. Make some judgments (not harsh ones, of course) about how good the questions are.)

THIRD STRATEGY

THINK

OBJECTIVE OF LESSON

The last strategy we want to talk about is THINK. Whenever we read we should try and think about what we already know about this topic we're reading. After we have read, or even before we read, we stop and ask ourselves "WHAT DO I KNOW ABOUT THIS?"

Then we think about it for a moment.

For example, how many of you like dinosaurs? (show OV17). Before you start reading this passage you should think about what you know about dinosaurs. (Ask some of the students what they already knew about dinosaurs. See if any knew what a Brachiosaurus was.)

INFORMATION ABOUT WHY

If we already know something about what we're reading, then it will be easier to read and understand. But we have to think about what we're reading. If you're reading a book about math, you should think about what you already know about math. If you're reading a book about horses, you should think about what you know about horses.

INFORMATION ABOUT WHEN/WHERE

Whenever you read about anything, and whether it's a sentence, or a paragraph, or a chapter, you should try to think about what you already know. This will help you understand it better.

INFORMATION ABOUT HOW

This is just a process of THINKING. You just think about it for a few minutes. It doesn't have to be a long time and it doesn't mean that you have know a lot about it. But if you do, you will better understand what you're reading. If you don't understand something you are reading, there are two places to go to try and understand. Go back and read through the passage again to see if it has the information you need to understand, or if you will have to rely on your own knowledge.

MODEL

I will read a passage now and show what I might ask myself or how I might think as I try to understand it. (OV18. Read the first few sentences and then, aloud, talk about what you know about this topic before reading any further. Then read through the entire passage.)

PERSONAL EXPERIENCE

Relate a personal experience when KNOWLEDGE helped you understand something you read.

GUIDED PRACTICE

Let's practice with a few sentences first.

(OV19)

In the first sentence, you remembered the nursery rhyme. That's using your knowledge to help. In the second sentence, you used your knowledge about sandwiches. That, too, helped because you know sandwiches are made with bread. In the third sentence, you had to use your knowledge about bears and think of some kind of animal or something the bear would run away from.

You can do this with paragraphs as well

(Handout a paragraph with several words missing. OV20 Ask the students to go through and fill in the blanks.)

Let's go through the words filled in. You tell me if you used the passage or your knowledge to fill in the blank. (1 = made 2= fire 3=stream 4=eggs 5=meat 6=gave 7=candy 8=pups 9=teeth)

(Hand out another passage [without blanks]. OV 21 Tell students to think about what they know about the passage before reading it. Give them a minute to think. Ask the students what they know. Talk about what they know for a minute, and then let them read the whole passage.)

When we talk or think about what we know, we will understand the passage better.

EVALUATION

Ask yourself when you read:
What do I know about this ?

If you don't understand something, ask yourself these questions.
Do I know something about this?
Does the passage talk about this anywhere?

FOURTH STRATEGY

PREDICT

OBJECTIVE OF THE LESSON

Today we're going to learn another strategy that will help us read better. This strategy is called PREDICT. What does it mean to predict something? (Ask for student response. It means to know what's going to happen before it happens.) As you read, it can help you understand what its saying by asking yourself "What will happen next?"

INFORMATION ABOUT WHY

When we try to predict what is going to happen, we are thinking more about what we've just read. Sometimes, when we read, we just go over a sentence really fast and we don't read it very well. Let me put up this sentence on the overhead (Put a sentence (OV22) on the overhead and immediately take it down.) Can anyone tell me what that sentence was about? What if I leave the sentence up there a little longer? (Leave the overhead on so that everyone has time to read it) It's easier to read if we read slowly. Trying to predict makes us read more carefully and makes us think about what we're reading.

INFORMATION ABOUT WHEN/WHERE

Use PREDICT when you are reading long passages like a chapter in a book or textbook. It will help you understand the whole chapter better. You may also use it when reading a paragraph. If you try to think what the next paragraph is going to talk about, you may find yourself understanding the first paragraph better.

INFORMATION ABOUT HOW

Even though we don't use this strategy on sentences. Let me use a couple of sentences to show you what I mean.

(Overhead 23)

Tim and Betty bought some popcorn at the _____. (Ask students to fill in blanks. MOVIES)

Mrs. Green was walking through the store when she lost her _____. (PURSE)

The school children were not allowed to feed the _____. (ANIMALS< LIONS, etc.)

These are a lot like THINK exercises. That's because you are trying to use what you already know to predict how the sentence will end. Each time you knew what was

going to be in the blank before it finished. This is what you need to do with an entire passage. You read one paragraph and think "What is going to come next?" Then you read the next paragraph to see if you were right. Or you might read one or two paragraphs and ask "What is going to come next?"

MODELING

I will read a paragraph and try to decide what will come next.

(OV24)

I can see that this peach is rolling quickly down the hill. I would guess that the next thing that will happen is that it will hit the bottom of the hill. Because it is creating a lot of destruction as it rolls down the hill, I would guess that when it hits the bottom of the hill it will either create more destruction or go splat.

Let's see if I'm right.

(read Part 2 on OV 24)

I was right. I took information in this first paragraph, thought about it, and decided what would happen in the next paragraph. Let's try another one.

(OV25 Expose only part 1)

This paragraph is about insects. So I would guess that the second paragraph will also probably be about insects. This is about insects eating. So the second paragraph will either be about insects eating or about insects doing some other kind of behavior.

Let me now read the second paragraph (Uncover the second part)

So, I find that the second part WAS more about insects eating, specifically insect larvae eating. But trying to guess what was in the second paragraph made me read more carefully and think more carefully about the first paragraph.

PERSONAL EXPERIENCE

Relate a personal experience where using PREDICT helped you better understand what you were reading.

GUIDED PRACTICE

Let's go through four examples. (Go To OV 26,27,28,29,30,31,32,33) I will pass out sheets with the passages, and you will read each passage and then write on the sheet what you think the next paragraph is about. We'll see who is right!. (For each passage, write down a few of the students' answers on the board and then put up the overhead with the answer on it.)

EVALUATION

You evaluate how well you predicted by comparing what you predicted with what you read. If you're wrong, that's okay. You don't need to be right. Sometimes, we're not going to predict correctly. (Show an example of one of the student's being wrong.) That's all right. Remember the important thing about trying to predict is not guessing right, but it is using the clues in the first passage to help you know what's going to come up.

FIFTH STRATEGY

SUMMARIZE

OBJECTIVE OF LESSON

Today I'm going to teach you a reading strategy that uses almost all the other strategies. This strategy is called "summarize." Does anyone know what "summarize" means? When you summarize a sentence, you take a long sentence and say what it means with fewer words. You are getting all the important information from that sentence.

Let's try one

"The quick brown fox jumped over the lazy white dog."(OV34) Who can summarize this for me? (The fox jumped over the dog). That would be a summary of that sentence. You can also summarize paragraphs, pages, chapters, and whole books. We're going to learn how to do that.

INFORMATION ABOUT WHY

Why should we try to summarize information?

Who can tell me word for word one of the passages that we read about yesterday?

Can someone tell me what one of the passages was about? (Let one of the students do it.)

What you just told me was a summary! If we can summarize what a story or chapter is about, we can remember it better. We can't remember all of the words, but if we can remember some of the words, and if those words are the important words, then we will understand what we read better.

WHEN/WHERE THE PROCESS IS USED

Anytime you read a chapter in a textbook, you should be trying to figure out which information is most important. You should always be trying to pick out what is most important in what you're reading.

INFORMATION ABOUT HOW

Four summarization rules (OV35)

1. Identify the main or most important information.
2. Ignore unimportant information.
3. Delete information that is repeated. Delete means "to get rid of."
4. Relate the most important information with supporting information.

So we, IDENTIFY, IGNORE, DELETE, and RELATE

(GO over the rules with the students several times until you feel certain that most know them.)

MODELING

(Go through and summarize two sentences as model, think aloud.)

(OV36)

I'm going to summarize these two sentences myself.

> **To catch prey, the peregrine falcon dives straight down toward the earth with its streamlined wings swept back like the wings on a space shuttle.**

First, I identify the most important information. First, the sentence is about a peregrine falcon. That's pretty important, so I'd better keep that. The sentence is describing how this bird catches prey. I'd better keep that in. I can see that it catches prey by diving straight toward earth. So that's important.

Second, I ignore what's unimportant. "Streamlined" I can take out without changing the meaning of the sentence. I can also take out "Like the wings on a space shuttle." If I take it out the sentence will still be basically the same.

Third, I delete information that's repeated. For example, the falcon is flying down towards earth. I can delete "towards earth" because if the falcon is flying down, where else would he be flying to?

Fourth, this rule only applies when we're summarizing longer passages, so I will ignore it for now.

So, I have summarized my sentence. (OV36 again)

I'm going to summarize another sentence. (OV36)

> **I have passed through countless villages of white-toothed, strong-boned folk all of whom attribute their remarkable health to a life of drinking this exceptionally nutritious fluid called mammoth milk.**

First, I identify the important information. What seems to be important here is that these people are so healthy because they drink mammoth milk.

Second, I identify what is not important. "I have passed through countless villages" is really not important. It has nothing to do with drinking of mammoth milk to make you healthy. "Remarkable" is not important. I can delete that. "White-toothed and strong-boned" is not important because "healthy" basically means the same thing.

Third, delete information that is repeated. "Exceptionally nutritious fluid is just another way of saying mammoth milk" So I delete that, too.

Fourth, this does not apply to one sentence.

So, I have my summarized sentence. (OV 36)

Let's have you try a couple of sentences on your own. I'll show you the sentence and you try to summarize it. Remember our summarization rules. (OV35)

IDENTIFY the important information.
IGNORE the unimportant information.
DELETE information that's repeated.
RELATE important information with related information.

(NOTE: practice the two sentences in OV37. If it seems that more practice is needed, Do the third sentence.)

As you do these sentences remember that there is not one right answer. There are always a lot of different ways to summarize things.

(Go through the summarized sentences together. Elicit from the students how they did it.)

Now I want to do more complex summarization.

We'll start with a passage (Go to OV38)

OV38 passage (You read it or have a student read it)

Now, let's go through our steps.

First, IDENTIFY what's important.

We want to know where this took place so, sitting on the bed is important. We want to know who, so we need to keep the boy's name (Pug). The appearance of the mist is important, and the changing of the mist into a boy is VERY important.

Second, ignore what's unimportant. The sentences about the moon aren't as important because we can still talk about the main idea of the story without talking about the moon.

Talking about the quilt can be eliminated as not too important.

Third, DELETE what's been repeated. The passage says that the mist grew denser and that it wavered. We can delete these sentences because we already know about the mist and we know it changed into a boy.

Fourth, RELATE important information with related information. What's most important is the fact that this boy appeared on the bed. But it's still important to get some idea where he came from and how it happened. So we talk about Pug sitting on the bed and the mist which eventually turned into the boy. So we get the important detail (Appearance of the boy) with the less important details (Pug sitting on the bed when the mist appeared).

Then we have a summary.

Now let me do another passage. (OV39)

(Go through the same steps as before.)

PERSONAL EXPERIENCE

Relate a personal experience when knowing how to summarize helped you.

GUIDED PRACTICE

(Students now go through and summarize four sample paragraphs (OV40,41,42) These will be on paper that you will pass out to the students. Have the students work on each passage and then show the sample summary. Students and teacher then go through and work through at least one of these paragraphs together.)

EVALUATION

After you summarize, you should ask yourself these questions.

Have I found the main idea that the paragraph is about?
Have I found the most important information that tells more about the main idea?
Have I used any information not directly about the main idea?
Have I used any information more than once?

Let's look at two summaries and you tell me if they are good summaries.

(Present two summaries all with problems. OV43 and OV44 Have students identify whether it is a good summary or not, and why.)

REVIEW AND PRACTICE

Go through and ask the students to define each strategy.

Take a passage and model reading it while using all strategies that are appropriate. (OV45)

Have the students help you as you do this.

First, THINK about what you know about the topic.
Second, read through the passage.
Third, IMAGINE a picture of the passage.
Third, ask QUESTIONS about the passage and try to answer them.
Fourth, PREDICT what the next passage would look like.
Fifth, SUMMARIZE the passage.

Then give the students another passage to read. (OV46)
Tell them to use all the strategies that are appropriate.
Ask them to fill in the questions below that ask them what they know about it, to ask questions, to predict, and to summarize.
After all students have completed the assignment, go over the assignment and see how well they do.

ASSESSMENT

Finally, give them a brief assessment of the strategies (provided by Eric).

CONTENT & STRATEGY LESSON PLANS

INTRODUCTION

How many of you like to read? (Wait for response)
What kinds of books do you like to read? (Responses)
How many of you like to read math books? Social studies books? Books about horses?

Let's look at two passages. (OV1 OV2 Ask a student to read one passage and another student to read the other passage. Take the overheads down)

Who can tell me what the first story was about?

Who can tell me what the second story was about?

What did the boy in the first passage want more than anything?

What kind of rock comes from volcanoes?

How old was the boy when he got "puppy love"?

What are "sediments"?

Which one did you like the best? Why?

Some books are a lot more fun to read than others. When you're in school, though, you have to read a lot of things that you don't really like to read. I'm going to be talking to you, in the next few weeks, about ways to help you read books and chapters that maybe you don't like to read very much. It's easy to read the stuff we like but harder to read what we don't like. But it's very important that we try to read everything as well as we can.

We are going to talk about five different strategies for reading. A strategy is like a tool. What do we use tools for? (To help us put things together). A strategy is something that helps you read and understand better.

These are the five different strategies (OV3)

Imagine
Question
Think
Predict
Summarize

We will spend some time talking about each one of these strategies, and we'll also give you time to practice these strategies. By the time you're done, if you use these strategies, you will all be expert readers!

One of the subjects you are studying this year is Utah History. Utah history can be one of those subjects that are hard to read about. So when we practice our strategies, we will practice on passages about Utah History. Not only will you be able to become better readers, but you may also learn a little more about the history of Utah.

However, you must remember one thing. Remember the first time you tied your shoes or played a piano piece? Were you good at it right away? NO! Practicing strategies takes time. When you first start doing these strategies, you won't be good at it and you'll have to read very slowly to do them. But if you keep practicing them and doing them, soon you'll read just as fast as you did before.

FIRST STRATEGY

IMAGINE

OBJECTIVE OF LESSON

The first strategy we want to look at is IMAGINE! One good way to understand and remember what you read is to make pictures in your mind. We will practice making pictures in our minds to help us understand and remember what we have read.

INFORMATION ABOUT WHY

Sometimes pictures are easier to remember than words. Name a movie that you've gone to see or a video you watched recently. (Allow children to respond) Which is easier to remember, a movie or a book? Or a movie and a page from your math textbook? Because pictures are sometimes easier to remember than words, then to make up a picture about what we are reading might make it easier to remember what we've just read.

INFORMATION ABOUT WHEN/WHERE

It's easy to make up pictures when reading a story. Especially if the story already has pictures in it. But we can make up pictures no matter what we're reading. Even if it isn't a story.

INFORMATION ABOUT WHAT/HOW

Let's take a look at HOW to do it.

Let's take a simple sentence.

(OV4) "The little gray mouse was running away from the scary black cat." (Hand out blank sheets of paper.) I want everyone to draw a picture of this sentence. (After completed, collect them and show some as examples.) You all created a picture of the sentence in your head and drew it on paper.

So as you read a sentence, you start trying to make a picture in your head. You say to yourself, "What would this mouse look like? What would the cat look like?"

MODELING

Now I will read a sentence and draw a picture on the board as I read the sentence.

(OV5)

Mary Ann rode her bicycle down to the drugstore to buy some milk.

(Draw a picture on the black board of the sentence)

Now, I'll take a longer passage from Utah History and try to draw a picture as I read the passage.

(OV6) Passage

(Draw appropriate pictures to illustrate the passage. You could draw a picture of a mountain man hiding furs. Or a bunch of mountain men together at a rendezvous.)

(OV7) Now let's do it with another passage.

(Draw pictures of a map, a newspaper, mountain men, traveling west)

No matter what I'm reading I can still draw a picture to show what it is.

PERSONAL EXPERIENCE

Relate a personal experience where the use of IMAGINE has helped you understand something you read.

GUIDED PRACTICE

Let's take three sentences and one by one draw a picture for each.

(After they've finished, compare pictures and let students know that it's not how good the picture is, but the fact that they are trying to draw a picture. It also doesn't matter what they draw as long as it is a good reflection of what the sentence is about.)

(OV8)

Now let's go through some paragraphs. One of them will be stories and one will be a passage that's not really a story.

(Let students read the passage and then draw a picture to illustrate it.)

(OV9, OV10)

Now on these last passages, I want you to read it and draw a picture IN YOUR MIND. Not on a piece of paper. You're not always going to be able to draw, so it's better to be able to do it in your mind.

(OV11, OV12)

(Have the students tell about the pictures that they imagined.)

SECOND STRATEGY

QUESTION

OBJECTIVE OF LESSON

IMAGINE helped us think about what we are reading. Another strategy which helps us to think while we're reading is QUESTION. The questions we ask ourselves as we read can help us understand better. They can also help us know when we don't understand. Let's take this sentence for example.

Jennifer was completely mesmerized by the movie.(OV13a)

Was there anything in that sentence you didn't understand? (Mesmerize)

So a question we might ask ourselves as we go through and read is "What does mesmerize mean?" (Ask a few students to respond. What do they think "mesmerize" means. Finally define mesmerize as "to hypnotize" or "to make someone really interested.")

INFORMATION ABOUT WHY

When we ask questions as we read, it makes us more aware of what we do and don't understand. If we just read quickly, without thinking about it, we might miss information that's important. Asking questions makes us stop and think about what we are reading.

INFORMATION ABOUT WHEN/WHERE

Anytime we are reading a paragraph, a sentence, or a story, or a chapter, we should try and ask ourselves questions as we read. Especially if we don't understand what we just read. We should stop and ask ourselves why we didn't understand it.

INFORMATION ABOUT HOW

First there are different kinds of questions that we can ask ourselves. There are "memory" questions and there are "thinking" questions. Memory questions are questions that simply repeat what you have just learned. Thinking questions mean that you don't just repeat what you've learned, you start thinking about it in a new way.

The best kinds of questions to make up are thinking questions.

(Give them a handout of the things below.) (OV 13b)

Here are some different thinking questions you can ask yourself.

Describe _____ in your own words.
What does _____ mean?
Why is _____ important?
Explain why....
Explain how...
How are ___ and _____ the same?
What is the difference between _____ and _____?
How does _____ affect _____?
What are the strengths and weaknesses of _____?
What causes _____?
How could _____ be used to _____?
What would happen if _____?
How does _____ tie in with what we learned before?

These are the kinds of questions we should ask ourselves as we read.

MODELING

I'll read through a couple of passages and generate THINKING questions as I do. I'll write my questions on the board and after I have finished reading, try to answer them. If I can't answer them all, explain that maybe I need to read a little more information and then I'll find the answers to my questions.

(OV13c)

(Ask yourself some of the above described questions after reading the passage about Mormons entering the Salt Lake Valley.)

(Go to OV14 and go through the same process.)

PERSONAL EXPERIENCE

Relate a personal experience where question generating helped you understand something you read.

GUIDED PRACTICE

I will pass out two passages for you to read. After you read each passage, I want you to write down the questions below the passage that you think are important. These should be thinking questions. If you need to, look at the handout with the different questions on them. (OV 15 and 16)

(Have some students read their questions. Make sure they are thinking questions. After that go through and try to answer some of the questions.)

EVALUATION

After you have generated your questions, you should ask yourself these three questions to determine if they were good questions.

How well did I pick out important information?
How well did I link the information together?
Can I answer my own question?

(Go through some of the questions generated by the students and ask these questions. Make some judgments (not harsh ones, of course) about how good the questions are.)

THIRD STRATEGY

THINK

OBJECTIVE OF LESSON

The last strategy we want to talk about is THINK. Whenever we read we should try and think about what we already know about this topic we're reading. After we have read, or even before we read, we stop and ask ourselves "WHAT DO I KNOW ABOUT THIS?"

Then we think about it for a moment.

For example, how many of you like sugar? (show OV17). Before you start reading this passage you should think about what you know about sugar. (Ask some of the students what they already knew about sugar. Make reference to the last passage they read which was about sugar beets. See if any students had heard of sugar beets before.)

INFORMATION ABOUT WHY

If we already know something about what we're reading, then it will be easier to read and understand. But we have to think about what we're reading. If you're reading a book about math, you should think about what you already know about math. If you're reading a book about horses, you should think about what you know about horses.

INFORMATION ABOUT WHEN/WHERE

Whenever you read about anything and whether it's a sentence, or a paragraph, or a chapter, you should try to think about what you already know. This will help you understand it better.

INFORMATION ABOUT HOW

This is just a process of THINKING. You just think about it for a few minutes. It doesn't have to be a long time, and it doesn't mean that you have know a lot about it. But if you do, you will better understand what you're reading. If you don't understand something you are reading, there are two places to go to try and understand. Go back and read through the passage again to see if it has the information you need to understand, or if you will have to rely on your own knowledge.

MODEL

I will read a passage now and show what I might ask myself or how I might think as I try to understand it. (OV18. Read the first few sentences and then, aloud, talk about what you know about this topic before reading any further. Then read through the entire passage.)

PERSONAL EXPERIENCE

Relate a personal experience when KNOWLEDGE helped you understand something you read.

GUIDED PRACTICE

Let's practice with a few sentences first.

(OV19)

In the first sentence, you remembered the nursery rhyme. That's using your knowledge to help. In the second sentence, you used your knowledge about sandwiches. That, too, helped because you know sandwiches are made with bread. In the third sentence, you had to use your knowledge about bears and think of some kind of animal or something the bear would run away from.

You can do this with paragraphs as well.

(Handout a paragraph with several words missing. OV20 Ask the students to go through and fill in the blanks.)

Let's go through the words filled in. You tell me if you used the passage or your knowledge to fill in the blank. (1 = made 2= fire 3=stream 4=eggs 5=meat 6=gave 7=candy 8=pups 9=teeth)

(Hand out another passage [without blanks]. OV 21 Tell students to think about what they know about the passage before reading it. Give them a minute to think. Ask the students what they know. Talk about what they know for a minute and then let them read the whole passage.)

When we talk or think about what we know, we will understand the passage better.

EVALUATION

Ask yourself when you read:

What do I know about this ?

If you don't understand something, ask yourself these questions.

Do I know something about this?

Does the passage talk about this anywhere?

FOURTH STRATEGY

PREDICT

OBJECTIVE OF THE LESSON

Today we're going to learn another strategy that will help us read better. This strategy is called PREDICT. What does it mean to predict something? (Ask for student response. It means to know what's going to happen before it happens.) As you read, it can help you understand what its saying by asking yourself "What will happen next?"

INFORMATION ABOUT WHY

When we try to predict what is going to happen, we are thinking more about what we've just read. Sometimes, when we read, we just go over a sentence really fast and we don't read it very well. Let me put up this sentence on the overhead (Put a sentence (OV22) on the overhead and immediately take it down) Can anyone tell me what that sentence was about? What if I leave the sentence up there a little longer? (Leave the overhead on so that everyone has time to read it.) It's easier to read if we read slowly. Trying to predict makes us read more carefully and makes us think about what we're reading.

INFORMATION ABOUT WHEN/WHERE

Use PREDICT when you are reading long passages like a chapter in a book or textbook. It will help you understand the whole chapter better. You may also use it when reading a paragraph. If you try to think what the next paragraph is going to talk about, you may find yourself understanding the first paragraph better.

INFORMATION ABOUT HOW

Even though we don't use this strategy on sentences. Let me use a couple of sentences to show you what I mean.

(Overhead 23)

Tim and Betty bought some popcorn at the _____. (Ask students to fill in blanks. MOVIES)

Mrs. Green was walking through the store when she lost her _____. (PURSE)

The school children were not allowed to feed the _____. (ANIMALS< LIONS, etc.)

These are a lot like THINK exercises. That's because you are trying to use what you already know to predict how the sentence will end. Each time you knew what was

going to be in the blank before it finished. This is what you need to do with an entire passage. You read one paragraph and think "What is going to come next?" Then you read the next paragraph to see if you were right. Or you might read one or two paragraphs and ask "What is going to come next?"

MODELING

I will read a paragraph and try to decide what will come next.

(OV24)

I can see that this paragraph is about coal mining in Utah. It talks about the different places where coal has been found. Then the paragraph ends with a question "What was the coal used for?" I would guess the next paragraph will answer that question. It will tell me what coal was used for back in those days.

Let's see if I'm right.

(read Part 2 on OV 24)

I was right. I took information in this first paragraph, thought about it, and decided what would happen in the next paragraph. Let's try another one.

(OV25 Expose only part 1)

This paragraph is about mining towns. So I would guess that the second paragraph will also probably be about mining towns. This is describing what the mining towns were like. So the second paragraph will either be more about mining towns or maybe talking about Mormon towns.

Let me now read the second paragraph (uncover the second part).

So, I find that the second part WAS more about mining towns, specifically the buildings in a mining town. But trying to guess what was in the second paragraph made me read more carefully and think about more carefully the first paragraph.

PERSONAL EXPERIENCE

Relate a personal experience where using PREDICT helped you better understand what you were reading.

GUIDED PRACTICE

Let's go through four examples. (Go To OV 26, 27, 28, 29, 30, 31, 32, 33.) I will pass out sheets with the passages and you will read each passage and then write on the sheet what you think the next paragraph is about. We'll see who is right!. (For each passage, write down a few of the students' answers on the board, and then put up the overhead with the answer on it.)

EVALUATION

You evaluate how well you predicted by comparing what you predicted with what you read. If you're wrong, that's okay. You don't need to be right. Sometimes, we're not going to predict correctly. (Show an example of one of the student's being wrong.) That's all right. Remember the important thing about trying to predict is not guessing right, but it is using the clues in the first passage to help you know what's going to come up.

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SUMMARIZE

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Today I'm going to teach you a reading strategy that uses almost all the other strategies. This strategy is called "summarize." Does anyone know what "summarize" means? When you summarize a sentence, you take a long sentence and say what it means with fewer words. You are getting all the important information from that sentence.

Let's try one

"The quick brown fox jumped over the lazy white dog."(OV34) Who can summarize this for me? (The fox jumped over the dog). That would be a summary of that sentence. You can also summarize paragraphs, pages, chapters, and whole books. We're going to learn how to do that.

INFORMATION ABOUT WHY

Why should we try to summarize information?

Who can tell me word for word one of the passages that we read about yesterday?

Can someone tell me what one of the passages was about? (Let one of the students do it.)

What you just told me was a summary! If we can summarize what a story or chapter is about, we can remember it better. We can't remember all of the words, but if we can remember some of the words, and if those words are the important words, then we will understand what we read better.

WHEN/WHERE THE PROCESS IS USED

Anytime you read a chapter in a textbook, you should be trying to figure out which information is most important. You should always be trying to pick out what is most important in what you're reading.

INFORMATION ABOUT HOW

Four summarization rules (OV35)

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So we, IDENTIFY, IGNORE, DELETE, and RELATE.

(GO over the rules with the students several times until you feel certain that most know them.)

MODELING

(Go through and summarize two sentences as model, think aloud)

(OV36)

I'm going to summarize these two sentences myself.

> **To catch prey, the peregrine falcon dives straight down toward the earth with its streamlined wings swept back like the wings on a space shuttle.**

First, I identify the most important information. First, the sentence is about a peregrine falcon. That's pretty important, so I'd better keep that. The sentence is describing how this bird catches prey. I'd better keep that in. I can see that it catches prey by diving straight toward earth. So that's important.

Second, I ignore what's unimportant. "Streamlined" I can take out without changing the meaning of the sentence. I can also take out "Like the wings on a space shuttle." If I take it out, the sentence will still be basically the same.

Third, I delete information that's repeated. For example, the falcon is flying down towards earth. I can delete "towards earth" because if the falcon is flying down, where else would he be flying to?

Fourth, this rule only applies when we're summarizing longer passages, so I will ignore it for now.

So, I have summarized my sentence. (OV36 again)

I'm going summarize another sentence. (OV36)

> **I have passed through countless villages of white-toothed, strong-boned folk all of whom attribute their remarkable health to a life of drinking this exceptionally nutritious fluid called mammoth milk.**

First, I identify the important information. What seems to be important here is that these people are so healthy because they drink mammoth milk.

Second, I identify what is not important. "I have passed through countless villages" is really not important. It has nothing to do with drinking of mammoth milk to make you healthy. "Remarkable" is not important. I can delete that. "White-toothed and strong-boned" is not important because "healthy" basically means the same thing.

Third, delete information that is repeated. "Exceptionally nutritious fluid is just another way of saying mammoth milk" So I delete that, too.

Fourth, this does not apply to one sentence.

So, I have my summarized sentence. (OV 36)

Let's have you try a couple of sentences on your own. I'll show you the sentence, and you try to summarize it. Remember our summarization rules. (OV35)

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DELETE information that's repeated.
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(NOTE: practice the two sentences in OV37. If it seems that more practice is needed Do the third sentence.)

As you do these sentences remember that there is not one right answer. There are always a lot of different ways to summarize things.

(Go through the summarized sentences together. Elicit from the students how they did it.)

Now I want to do more complex summarization.

We'll start with a passage. (Go to OV38)

OV38 passage (You read it or have a student read it.)

Now, let's go through our steps.

First, IDENTIFY what's important. The streetcar lines are important. Maybe the towns they are in. Then we want to know why there aren't any streetcar lines.

Second, IGNORE what's unimportant. It's not important to know how many lines each city had, so we can ignore that. How long Logan's longest line was is probably not too important, either.

Third, DELETE what's been repeated. Not much has been repeated in this passage.

Fourth, RELATE important information with related information. We want to relate the removal of streetcar lines with what? Paving of streets.

Then we have a summary.

Now let me do another passage. (OV39)

(Go through the same steps as before)

PERSONAL EXPERIENCE

Relate a personal experience when knowing how to summarize helped you.

GUIDED PRACTICE

(Students now go through and summarize four sample paragraphs (OV40, 41, 42). These will be on paper that you will pass out to the students. Have the students work on each passage and then show the sample summary. Students and teacher then go through and work through at least one of these paragraphs together.)

EVALUATION

After you summarize, you should ask yourself these questions:

Have I found the main idea that the paragraph is about?
Have I found the most important information that tells more about the main idea?
Have I used any information not directly about the main idea?
Have I used any information more than once?

Let's look at two summaries and you tell me if they are good summaries.

(Present two summaries all with problems. OV43 and OV44 Have students identify whether the it is a good summary or not and why.)

REVIEW AND PRACTICE

Go through and ask the students to define each strategy.

Take a passage and model reading it while using all strategies that are appropriate. (OV45)

Have the students help you as you do this.

So, before you begin reading something.

First, THINK about what you know about the topic.
Second, read through the passage.
Third, IMAGINE a picture of the passage.
Third, ask QUESTIONS about the passage and try to answer them.
Fourth, PREDICT what the next passage would look like.
Fifth, SUMMARIZE the passage.

Then give the students another passage to read. (OV46)

Tell them to use all the strategies that are appropriate.

Ask them to fill in the questions below that ask them what they know about it, to ask questions, to predict, and to summarize.

After all students have completed the assignment, go over the assignment and see how well they do.

ASSESSMENT

Finally, a give them a brief assessment of the strategies.

Appendix C

Instructor Observation Forms

Classroom 2 1:30 - 2pm

	3/5	3/10	3/12	3/17	3/18	3/25
TOPIC						
Imagining	✓					✓
Summarizing				✓		✓
Thinking		✓	✓		✓	
Predicting		✓			✓	
Questioning (Asking)			✓		✓	✓
PRACTICE	✓	✓		✓	✓	✓
Fur Trade	✓					
Mountain Men	✓					
Trading Posts	✓					
Irrigation						
Utah crops						
Livestock						
Agricult. Industry						
Minerals in Utah		✓	✓			
Boom Towns					✓	
Mining		✓	✓		✓	
History of Railroad		✓		✓	✓	
Railroad and Agricul.		✓		✓		
Railroad and Mining		✓		✓		
Depressions						

Summitt Elementary
Mrs. Shaffer (Rm. 4)

Classroom 1 12:50 - 1:20 p.m

	3/10	3/11	3/18	3/19	3/24	3/26
TOPIC						
Imagining	✓	✓				
Summarizing					✓	✓
Thinking	✓	✓	✓	✓		✓
Predicting			✓	✓		
Questioning (Asking)	✓	✓		✓		
PRACTICE	✓	✓	✓	✓	✓	✓
Fur Trade						
Mountain Men						
Trading Posts						
Irrigation						
Utah crops						
Livestock						
Agricult. Industry						
Minerals in Utah				✓		
Boom Towns						
Mining						
History of Railroad						
Railroad and Agricul.						
Railroad and Mining						
Depressions						

Summitt Elementary
Mrs. Swan (Rm. 17)

Classroom 3 2:30 - 3p.m.

	3/4	3/5	3/17	3/18	3/27	3/26
TOPIC						
Imagining						
Summarizing	✓					
Thinking	✓					✓
Predicting	✓					
Questioning (Asking)	✓	✓				
PRACTICE	✓	✓		✓		
Fur Trade		✓				
Mountain Men		✓				
Trading Posts						
Irrigation						
Utah crops						
Livestock				✓		
Agricult. Industry				✓		
Minerals in Utah			✓	✓		
Boom Towns			✓			
Mining			✓	✓		
History of Railroad					✓	✓
Railroad and Agricul.					✓	✓
Railroad and Mining					✓	✓
Depressions						

Summit Elementary
Mr. McCallister (Rm. 20)

Appendix D

Sources Used in Creating the Lesson Plans

SOURCES USED IN CREATING THE LESSON PLANS

Bancroft, H. H. (1982). Reproduction of Hubert Howe Bancroft's history of Utah 1540-1886. Las Vegas: Nevada Publications.

Burt, O. (1963). The first book of Utah. New York: Franklin Watts.

Cameron, M. (1939). This is the place. Caldwell, ID: Caxton Printers.

Ellsworth, S. G. (1985). The new Utah's heritage. Salt Lake City, UT: Peregrine Smith Books.

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Luce, W., & Luce, C. (1958). Utah: Past and present. Provo, UT: Utah Color.

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Poll, R. D., Alexander, T. G., Campbell, E. E., & Miller, D. E. (1989). Utah's history. Logan: Utah State University Press

Powell, A. K. (Ed.). (1994). Utah history encyclopedia. Salt Lake City: University of Utah Press.

Proctor, P. D., & Morris, A. S. (1991). Silver, sinners and saints: A history of Old Silver Reef Utah. Salt Lake City, UT: Paulmar.

Robertson, F. C., & Harris, B. K. (1962). Boom towns of the Great Basin. Denver, CO: Sage.

Vita

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Education

1985	Associates of Arts and Science, Ricks College (General Education)
1990	Bachelor's of Science, Utah State University (Psychology) (graduated magna cum laude)
1995	Master's of Science, Utah State University (Psychology-Research and Evaluation Methodology)
1997	Doctor of Philosophy, Utah State University (Psychology-Research and Evaluation Methodology)

Professional Associations

Member of the American Evaluation Association (AEA)
Member of the American Educational Research Association (AERA)

Teaching Experience

(Course syllabus available upon request)

Lab Instructor, Educational Psychology (undergraduate course).
Supervised labs. Led class discussions on educational topics. Proctored and corrected exams. Graded student papers. Tutored students. Developed class exercises.

Instructor, Educational Psychology (undergraduate course).
Lectured on the following topics: developmental psychology, behaviorism, cognition, motivation, psychometrics, and statistics (as they apply in educational settings). Constructed and administered exams. Supervised instruction of labs. Developed and selected lab activities.

Instructor, Analysis of Behavior (undergraduate course).
Lectured on the following topics: history of behaviorism, classical conditioning, operant conditioning, aversive control, schedules of reinforcement, and research methodology in behavioral research. Constructed and administered exams. Coordinated instruction and maintenance of labs where students trained rats in a variety of behaviors.

Instructor, Principles of Learning (graduate course).
Lectured on the following topics: information-processing model, schema theory, propositional networks, production systems, learning strategies, cultural cognition, problem-solving, and cognitive processes involved in reading, science, math, and

writing. Constructed exams. Assigned and corrected class projects. Taught class twice over distance learning system.

Instructor, Cognitive Psychology (undergraduate course).
Lectured on the following topics: information-processing model, perception, schema theory, language, formal logic, decision-making. Constructed and corrected essay exams. Assigned and corrected informal research projects. Taught class once over distance learning system.

Instructor, Research Methods in Social Sciences (undergraduate course).
Lectured on the following topics: philosophy of science, sampling, experimental design, quasi-experimental design, data collection, validity, reliability, ethics in science. Constructed exams. Constructed class projects. Taught class once over distance learning system.

Teaching Assistant, Evaluation Methods (graduate course).
Supervised student evaluation projects. Assisted in final simulation activity. Corrected exams and papers. Proctored exams. Advised students. Some lecturing on topics like evaluation methodology, different evaluation approaches.

Teaching Assistant, Research Methods (graduate course).
Instructed students on use of library resources. Assisted in development of curricular materials such as library research assignment and statistics pretest. Corrected and proctored exams. Advised students. Some discussion with students on following topics: coding sheets, data analysis, SPSS.

Teaching Assistant, Grantsmanship (graduate course).
Assisted in maintenance of course. Collected papers. Corrected exams. Calculation of final grades. Coordinated final simulation activity which was writing a grant dealing with ethics in science.

Teaching Assistant, Advanced Research Methods (graduate course).
Assisted in design of curricular materials. Class outlines. Proctored exams. Advised students.

Teaching Assistant, Alternative Methods of Evaluation (graduate course).
Proctoring exams. Grading papers written by students. Some supervision of evaluation activities engaged in by students.

Occasionally lectured in undergraduate psychology statistics course on nonparametric statistics, undergraduate communications research course on definition and development of research constructs and graduate level advanced learning theories course on cognitive processes.

Professional Activities

Student Assistant (undergraduate), research project on guilt and shame.
Designed and administered surveys. Designed coding sheet. Data entry.

Interviewer, Evaluation of Site-based Decision-making Model.
Visited schools and conducted focus group interviews with teachers, administrators, parents, staff, and students. Transcribed interviews.

Team member, Evaluation of Video Classrooms Project.
Designed survey. Conducted telephone surveys. Made on-site visits. Conducted focus group interviews.

Evaluator, Service Learning in Science Education, evaluation of seminar sponsored by National Science Foundation.
Conducted extensive observations over period of two weeks. Kept daily record of events. Participated in all aspects of the seminar. Assisted in writing the final report.

Project coordinator, Survey of Migrant Education Parents.
Supervised evaluation students working on the project. Supervised design of questionnaire asking parents of migrant education students their opinions of the program. Oversaw analysis of results. Co-wrote the final report.

Project coordinator, Drug-free schools Program in Cache County School District Evaluation.
Supervised evaluation students in evaluation activities. Supervised development of questionnaire. Supervised development of focus group interview schedule. Coordinated distribution and administration of questionnaires. Conducted and coordinated focus group interviews with high school and middle school students. Assisted in writing of final report.

Student Supervisor, Centennial Schools Evaluation.
Supervised evaluation students participating in the above evaluation. Scheduled meetings, established contacts with students, assisted in focus group interview schedule development.

Team member, High Technology Schools Project Evaluation.
Assisted in design of evaluation. Made several on-site visits Assisted in data collection which involved extensive classroom observations. Designed Time On-Task measure.

Data analyst, Cluster evaluation of the W. K. Kellogg Foundation Food Systems Professions Education Initiative.
Supervised data entry, collection of questionnaires. Analyzed quantitative and qualitative data.

Project Coordinator, evaluation of the Fit Kids of Utah program.
Assisted in design of the evaluation. Coordination of evaluation activities such as site visits and instrument development. Supervised test administration and writing of report.

Other Related Work Experience

Reading Tutor, Reading Lab, Ricks College.
Tutored students with reading problems. Taught workshop on writing effectively. Administered reading tests. Supervised reading tutors.

Volunteer, Helpline.
Provided crisis intervention and information referrals.

Certified Nursing Assistant, Sunshine Terrace.
Assigned to Alzheimer's unit. Provided daily care and maintenance for residents. Administered some therapy. Kept records on assigned residents.

In addition, I have supervised the arrangement and collection of references for a textbook being written by Dr. Blaine Worthen of Utah State University, Dr. James Sanders of Western Michigan University, and Dr. Jody Fitzpatrick of University of Colorado.

Research and Writing Activities

Gee, E. (1995). The effects of critical-thinking skills training on performance of students in an educational psychology class. Unpublished master's thesis, Utah State University, Logan.

Gee, E. (1995, April). The effects of a whole language approach to reading instruction on reading comprehension: A meta-analysis. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Gee, E., & Worthen, B. R. (1995). Report on the results of the survey of migrant education parents. Unpublished manuscript, Western Institute of Research and Evaluation, Logan, UT.

Gee, E. (1997). The interactive effects of domain-specific knowledge and strategic knowledge on reading comprehension. Unpublished doctoral dissertation, Utah State University, Logan.

Gee, E., & Shuster, T. (1997). Report on the evaluation of the Fit Kids Utah project. Unpublished manuscript, Western Institute of Research and Evaluation, Logan, UT.

Spach, D., & Gee, E. (1996). Report on the evaluation of the Cache School District's drug-free schools program. Unpublished manuscript, Western Institute of Research and Evaluation, Logan, UT.