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Exploring the Use of Effective Learning Strategies to Increase Students'

Reading Comprehension and Test Taking Skills

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Abstract

This study examined the effects of providing students with explicit instruction in how to use a repertoire of reading comprehension strategies and test taking skills when reading and responding to three types of questions (direct, inferential, critical). Specifically, the study examined whether providing students with a “model” of how to read and respond to the text and to the comprehension questions improved their reading comprehension relative to providing them with implicit instruction on reading comprehension strategies and test taking skills. Students’ reading comprehension and test taking performance scores were compared as a function of instructional condition.

Students from 2 grade 8 classes participated in this study. The reading component of the Canadian Achievement Tests, Third Edition (CAT/3) was used to identify students’ level of reading comprehension prior to the formal instructional sessions. Students received either explicit instruction, which involved modelling, or implicit instruction, which consisted of review and discussion of the strategies to be used.

Comprehension was measured through the administration of formative tests after each instructional session. The formative tests consisted of reading comprehension questions pertaining to a specific form of text (narrative, informational, graphic). In addition, students completed 3 summative tests and a delayed comprehension test which consisted of the alternative version of the CAT/3 standardized reading assessment. These data served as a posttest measure to determine whether students had shown an improvement in their reading comprehension skills as a result of the program delivery.

There were significant differences in students’ Canadian Achievement Test performance scores prior to the onset of the study. Students in the implicit group attained

significantly higher comprehension scores than did students in the explicit group. The results from the program sessions indicated no significant differences in reading comprehension between the implicit and explicit conditions, with the exception of the 6th session involving the reading and interpreting of graphic text. Students in the explicit group performed significantly better when reading and interpreting graphic text than those in the implicit group. No significant differences were evident between the two study conditions across the three summative tests.

Upon completion of the study, the results from the Canadian Achievement Test indicated no significant differences in performance between the two study conditions. The findings from this study reveal the effectiveness of providing students with explicit strategy instruction when reading and responding to various forms of text. Modelling the appropriate reading comprehension strategies and test taking skills enabled students to apply the same thought processes to their own independent work. This form of instruction enabled students in the explicit group to improve in their abilities to comprehend and respond to text and therefore should be incorporated as an effective form of classroom teaching.

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CHAPTER ONE: INTRODUCTION TO THE STUDY

This section discusses the background of the problem associated with literacy skills in children.

Background of the Problem

School boards across the province have recognized the need to provide extensive training and resources to educators so that they can improve children's literacy skills. For instance, the provincial government has increased the funding allotted to purchasing programs that will enhance the reading and writing skills of children at all levels of their educational career (Ministry of Education, 2005). Presumably, this financial support will provide educators with more effective means of delivering the necessary skills that are required to develop efficient and skilled readers.

The ability to decode and comprehend effectively is vital for meeting the demands of everyday life. Methods of communication have increased dramatically over a short period of time. Messages are provided in various forms that require the ability to read and interpret written material. In this era, most of communication stems from advances in technology (Pascoe, 2004). Computers transmit email messages, and an infinite supply of web pages share masses of information. Cell phones provide the option of text messages as do other media, including newspapers, magazines, televisions, and fax machines. It is our obligation as educators to provide all students with means of making meaning from such diverse communications.

Results from standardized testing have made the Ministry of Education aware of the need to provide students with extensive literacy support (Ministry of Education, 2005). The 2002 report of the United Nations Children's Fund found that 10% of 15-

year-olds in Canada were unable to solve basic reading tasks such as locating simple textual information, making low-level inferences, and forming connections to prior knowledge. According to results from yearly provincial assessments conducted by the Education Quality and Accountability Office (EQAO), our educational system has not prepared all students for a life in a literacy-rich society. For instance, the results from the May 2002 tests show that 50% of the province's grade 3 students and 45% of the grade 6 students scored below grade-level expectancy in reading (Hamilton Wentworth District School Board Results, 2004). Data from the U.S. 1998 National Assessment of Reading Progress reported that 38% of students in grade 4 and 23% of students in grade 12 demonstrated reading performance which was below grade level (Donahue, Voelkl, Campbell, & Mazzeo, 1999). Unfortunately, the lower level of grade 12 students experiencing reading difficulties is not attributed to overall greater performance for these students, but rather is attributed to the fact that "adolescents with a reading disability are at a high risk for dropping out of school and for remaining underemployed or unemployed, leading a life of poverty" (Wilson, 1999, p. 24).

When children experience reading problems early in their school careers, their overall self-image and sense of self-worth can be affected negatively (Smith, Polloway, Patton, Dowdy, & Heath, 2001). Educational researchers also caution that children with reading problems are more likely to exhibit lower levels of motivation and higher levels of inappropriate behaviour. Without proper support, poor self-esteem, unemployment, and depression can be prevalent themes in their adult lives. Movement for Canadian Literacy (2002) reports that adults with literacy difficulties have salaries that are 33% lower and are twice as likely to be unemployed compared to their adult counterparts who

do not have such difficulties. In addition, individuals with low reading abilities often have difficulties accessing important information such as health and safety information, which may factor into general levels of poor health (Movement for Canadian Literacy). It has been reported that 75% of grade 3 students with reading disabilities who did not benefit from intervention continue to face problems with reading throughout their later schooling and adult lives (Lyon, 2001 as cited in Learning Disabilities Association of Canada, 2001). As a result, these children tend to avoid reading, adding to the increased rate of high school dropouts and illiterate adults in the work force (Power & Cotterell, 1981). We as educators need to find ways to break this cycle by empowering struggling readers to understand better the messages in the print-rich society that surrounds them.

Some students struggle with the decoding component of reading; finding it difficult to connect sounds and symbols together to create coherent words, phrases, and paragraphs. Other students can decode words, but the underlying message of the text seems to elude them. They find it difficult to gather meaning from the words and sentences on a page and can finish a text without having a true understanding of what they have just read. These students are missing the true purpose of reading—making meaning (Cain, 1999).

Research examining the differences between good and poor readers has demonstrated that good readers are far more likely to employ reading comprehension strategies than are poor readers (e.g., Cain, 1999). In the last 2 decades, researchers have explained a variety of strategies that can assist students in creating meaning from text (see Mastropieri & Scruggs, 1997 for a review). For instance, instructing students to use think-aloud strategies while reading (e.g., Baumann, Jones, & Seifert-Kessell, 1993) has

been found to enhance the comprehension skills of developing readers. Researchers have also shown that reading comprehension improves significantly when students have been instructed to make connections between x and y when reading (McNamara, Kintsch, Songer, & Kintsch, 1996). The strategy of mental imagery has also shown to improve students' comprehension, memory, and the interpretive understanding of text. Studies have shown that using mental imagery facilitates the reading comprehension of both children and adults (Guttman & Levin, 1977; Piaget & Inhelder 1971; Shimron, 1975). Creating pictures in the mind encourages readers to integrate information across text so that they can engage in the constructive processing of text information.

Studies have shown that students with reading difficulties often fail to use the "before," "during," and "after" reading strategies that are essential in improving comprehension (Guthrie & Davis, 2003; Janzen, 2003; Nist & Simpson, 1996). For this reason, many students have difficulties in reading and therefore struggle when required to form an understanding of written text. Consequently, this can result in difficulties when responding to reading comprehension test questions. Numerous strategies must be used in order for students to develop the skills required to comprehend what they read and effectively respond to test questions. Specifically, combining the use of "before," "during," and "after" reading strategies with the understanding of how to detect and approach various types of reading comprehension questions (direct, inferential, critical) is vital to successful reading comprehension. Research has shown (Pressley & Wharton-McDonald, 1997) that explicit strategy instruction and extensive teacher modelling of effective strategies can be helpful in teaching all students, including those with reading difficulties. The ability to activate the most appropriate reading strategies while studying

text, combined with the ability to determine the type of test question being used while answering items, are vital skills and play a significant role in determining students' academic achievement, especially on standardized tests (Putnam, 1992).

Unfortunately, teaching students to use strategies independently and accurately is a time-consuming process. In addition, it is especially difficult for students to develop an understanding about “when” and “where” to use individual strategies. Explicit strategy instruction is a successful means of teaching students about effective learning strategies (e.g., Mastropieri & Scruggs, 1997; Pressley & Woloshyn, 1995). Specifically, modelling the use of strategies for students, providing them with extensive guided practice and feedback, and teaching them cues to guide their thinking processes are components of explicit instruction that have been demonstrated to enhance students' learning. However, teaching explicitly involves a great deal of time, which can be especially concerning to teachers who are already struggling with demanding curriculum material.

Another difficulty associated with the research on reading strategies is that much of it involves working with small groups of students, a luxury which is often not feasible in public school classrooms. Large class sizes, heavy curriculum demands, and classes of students with a wide variety of academic, social, and emotional needs put quality small-group instructional time at a premium (Cohen, 1992). In addition, the number of special education teachers and support services has been reduced, while the demand for their services appears to be increasing (Tobin & Sprague, 1999). While it is tempting to suggest that the special education resource teacher work with small groups of children to teach them reading strategies, the reality is that all children in the classroom benefit from

strategic instruction, and thus it is the duty of the classroom teacher to provide this form of instruction. This format of instruction is also likely to increase the generalization and transfer of learning strategies to other tasks and curriculum areas.

Only a small fraction of the studies on reading strategies examine the possibility of teaching students a repertoire of strategies (e.g., Brown, Pressley, Van Meter, & Schuder as cited in Pressley & Woloshyn, 1995). Most researchers examine how instruction in one specific strategy influences students' comprehension. In a review of the research on strategies for improving reading, Mastropieri and Scruggs (1997) concluded that "instruction in almost any of these strategies appears to have some facilitative effect on reading comprehension, and instruction in some of the strategies appears to have a large, powerful effect" (p. 209). The authors further note that the effects of combining strategies may be especially beneficial. The advantages of teaching students a combined repertoire of strategies are twofold: Students are able to recap benefits offered by more than one reading strategy, and the time needed to learn and apply the various strategies may be lessened when the strategies are combined and taught as one strategic tool.

Overview of Present Study

The purpose of the current study was to provide students with either implicit or explicit instruction for reading comprehension strategies and test taking skills, while covering some of the curriculum expectations defined for their grade level by the Ontario Ministry of Education. Specifically, implicit instruction consisted of a discussion and review of the strategies taught within each session, whereas explicit instruction consisted of think-aloud modelling of the strategies by the researcher. In addition, the strategies

and skills were presented to students as part of a whole group, thereby maximizing class time and increasing the likelihood that the strategies could be generalized to other classroom reading programs.

Definition of Terms

This section provides a definition for each of the terms used in the present study.

Canadian Achievement Tests, Third Edition (CAT/3): The reading comprehension subsections of this standardized achievement test were used as an initial assessment (pretest) to identify children's initial reading levels and as a delayed test (posttest) to determine any improvement in reading comprehension as a result of program delivery.

Comprehension: making meaning; in the case of reading comprehension, making meaning out of written material (e.g., Cain, 1999).

Critical questions: reading comprehension questions that require one to connect the author's thoughts with one's own personal experiences.

Direct questions: reading comprehension questions that require one to read the text in order to locate the answer.

Explicit group: This group of students received explicit strategy instruction after each session. The first reading comprehension activity was explicitly modelled to the students in the form of a think-aloud, and the second activity was completed independently.

Explicit strategy instruction: Explicit strategy instruction involves the researcher modelling the strategy for the students. It also includes verbalizing the thought process while using the strategy and giving the students reasons as to why they should use the

strategy and where and when they should use it. Students are provided with guided practice sessions which include teacher prompts and feedback in order for students to gradually become successful in using the strategy independently (e.g., Pressley et al., 1991; Pressley & Woloshyn, 1995).

Field notes: The instructor recorded field notes based on any thoughts or feelings that were experienced with respect to the program delivery. More specifically, any successes and drawbacks as well as any other information deemed relevant from the researcher's or students' point of view were recorded as anecdotal records in a journal. These field notes provided the researcher with information on the rate of student growth and learning amongst both groups along with the researcher's experiences throughout the course of the study.

Formative tests: Students were given a series of reading comprehension questions upon the completion of each session. These questions pertained to the readings in each session and served as a valuable assessment measure that determined the performance differences between both groups of students.

Graphic text: reading text that provides information in the form of graphs, tables, charts, maps, etc.

Implicit group: This group of students received implicit strategy instruction after each session. The first activity was completed independently by all students and then a review of the strategies and skills took place in the form of a class discussion. Following this, the students completed the second activity independently.

Implicit strategy instruction: Implicit strategy instruction involves the researcher providing a discussion and review of the strategies taught within each session. The

discussion involves all group members and gives each student a chance to share their thoughts on the strategies taught with the researcher.

Inferential questions: reading comprehension questions that require one to search for clues in the text to determine the most appropriate answer.

Informational text: reading text that provides the reader with information relating to facts, data, new concepts, etc.

Mental imagery: constructing mental representations of written text.

Metacognitive knowledge: an understanding of when, where, and how to apply reading comprehension strategies taught through explicit instruction.

Narrative text: reading text that is written in the form of telling a story, account, or tale.

Prior knowledge: possessing specific background knowledge relevant to a text.

Program sessions: The program consisted of a total of 10 sessions. Each session focused on teaching a specific reading comprehension strategy or test taking skill that would improve students' reading and responding performance.

Reading level: For the purpose of this study, students' reading level was defined using the scores on the Canadian Achievement Tests, Third Edition (CAT/3) Reading Assessment.

Reading comprehension strategies: Reading strategies can be defined as "mental and behavioural activities that people use to increase their likelihood of comprehending text" (van den Broek & Kremer, 2000, p.10). "Any systematic, goal directed behaviour that can be generalized beyond the immediate task ([e.g.,] the particular text)" (Johnston, 1985 p. 636). The current study examines a repertoire of

“before,” “during,” and “after” reading strategies (prior knowledge, making connections, mental imagery, text structure) presented throughout the program sessions.

Summative tests: Upon completion of the program sessions, all students in both groups completed three tests that incorporated the reading comprehension strategies and test taking skills taught throughout the program. Each test focused on one of the forms of text instructed throughout the program (narrative, informational, graphic). The format consisted of short answer and multiple choice questions. Their purpose was to determine whether the students were able to transfer the skills they had learned from the program and apply them to a test situation.

Test taking skills: Test taking skills are skills that students learn in order to enhance their test taking performance. Throughout the program, study skills were taught to improve student performance on reading three types of questions (direct, inferential, critical) in two different formats (multiple choice and short answer). The skills that are required to answer these types of questions in their varied forms aid in overall test performance.

Text structure: structural aspects of text (e.g., bold, italics, font size, headings).

Think aloud: verbalizing cognitive thought processes while reading text aloud.

Chapter Summaries

The literature review presented in Chapter Two explores the nature of effective reading comprehension strategies and test taking skills. Research on strategies which have been used to promote students’ comprehension are presented, with a focus on prior knowledge, making connections, mental imagery, and text structure. Following this is a discussion of the various test taking skills that can be combined with reading

comprehension skills to enhance students' overall test performance. Chapter Three provides an overview of the methodology, including a description of participants, procedures, and materials used here. Chapter Four presents the findings, and Chapter Five includes the implications of the findings and final conclusions.

CHAPTER TWO: LITERATURE REVIEW

We live in a society where being literate is central to one's success in the educational world (Tovani, 2000). Reading is required in many of our daily occupational and recreational activities and is a prerequisite for success in our educational system (Dechant, 1991; Pressley, 1998). For this reason, it is necessary that the skill of reading is taught as effectively as possible by all teachers in our education system. There are many components involved in the teaching of reading, and it is imperative that all teachers are made aware of the strategies which aid in creating effective readers. The skill of reading can be divided into two components: the decoding and the comprehension of words (Lorch, 1989). Both of these components are necessary in order to become an effective reader.

As students progress from the primary to secondary grades, the instructional focus shifts from lower order processing skills, such as decoding, to higher order processing skills, such as comprehension (Beers, 2003). However, students who are poor readers often continue to receive instruction in decoding, which delays the development of their instruction in reading comprehension (Block, Gambrell, & Pressley, 2002). As a result of this delay, struggling readers may never acquire the skills that are necessary to become truly effective readers. Some researchers believe that this is one of the underlying factors of poor comprehension (e.g., Hansen & Pearson, 1983). Therefore, one goal is to teach the decoding of words, which would provide a smooth transition into the development of reading comprehension. For this reason it is vital to determine the strategies that are most effective in developing competent and successful comprehenders.

In order to show that readers have developed an understanding of the text content, comprehension questions are provided to assess and evaluate students' level of understanding. The education system has developed various tests that are used to determine students' level of reading comprehension. In Ontario, the focus in the intermediate grades has been on preparing students for the Ontario Secondary School Literacy Test (Education Quality and Accountability Office, 2004). This test is administered in grade 10, and educators have been faced with increased pressure to teach students test related strategies. For this reason, study skills literacy programs have been purchased by school boards across the province in hopes that the extra instruction will benefit struggling readers. Educators have also acknowledged the value in teaching students' test taking skills that would enhance their reading comprehension skills in a test situation. Teaching both reading strategies and test taking skills provides students with a broad understanding of the many skills required to succeed when completing a reading comprehension test.

This chapter presents an overview of the research on reading comprehension. First, the components of good comprehension (e.g., prior knowledge, making connections, mental imagery, and text structure) are examined, followed by a repertoire of strategies that would enhance comprehension skills in struggling readers. The second half of this chapter examines how students' comprehension skills, especially those students with reading difficulties, can be enhanced through the provision of effective instructional strategies. Specifically, the research supporting the use of explicit instruction which incorporates modelling, guided practice and feedback, attributional instruction, and monitoring of students' progress has shown significant gains in reading

comprehension. The last section of this chapter presents information on the effectiveness of teaching test taking skills and its connection to reading comprehension test performance.

What Is Comprehension?

Comprehension can be defined as the process whereby a reader constructs a mental representation of the author's message, which includes both the information in the text and its interpretation by the reader (Dechant, 1991; van den Broek & Kremer, 2000). Dechant states that comprehension relies on two types of information: that which is received from the text (the surface structure of the text) and that which is retrieved from the reader's memory. The schemas of past experiences and prior knowledge that are contained in the reader's memory are critical in assisting readers to construct meaning from the text. By relating new ideas encountered in the text to familiar ideas and mental constructions, readers build an understanding of the text material, and comprehension occurs.

The skill of reading comprehension is effectively acquired through positive interactions between the learner and educator. Explicit strategy instruction is a valuable method of teaching students of all age levels and abilities. This form of instruction provides a substantial amount of observational learning and modelling of effective learning strategies. Therefore, the nature of good learning stems from the underlying principles of Vygotsky's theory on social constructivism. Through social interactions and the opportunity to engage in increased practice, rehearsal, and elaboration of learned material, learners develop a profound understanding of the strategies underlying reading comprehension. Evidence has revealed that adults in position of authority can play a

central role in determining learners' ways of coping with a learning situation (Rogoff, 1990). The beneficial effects of social interaction on cognitive growth unfold through the process of on-task verbal interaction in discussion (Ben-Ari & Kedem-Friedrich, 2000). This unique role of on-task verbal interaction between the instructor and learner has allowed social constructivists to emphasize the role of explicit dialogue in learning. The verbal discussion that takes place during instructional sessions creates a vocabulary that, over time, becomes internalized into what Vygotsky (1962) defined as inner speech which, in turn, becomes a part of the repertoire of cognitive skills. In addition, a critical factor for children's cognitive growth is the presence of knowledgeable others who help them to arrive at understandings that they could not have accomplished on their own. The central problem that constructivist educators face is not a lack of guiding theory, but concrete strategies and tools for institutionalizing these theoretical and practical understandings into more inclusive classrooms (Bruner, 1996).

Components of Good Comprehension

This section discusses the instructional strategies that develop components of good reading comprehension.

Prior Knowledge

Content knowledge and knowledge of effective learning strategies are necessary for effective comprehension (Perfetti, Marron, & Foltz, 1996; van den Broek & Kremer, 2000). Perfetti et al. suggest that knowledge at many levels may be a fundamental difference between good and poor readers. For example, knowledge of word meanings and concepts is needed to construct an accurate representation of the text. Readers' knowledge also affects their use of strategies (Afflerbach, 1990; Perfetti et al.). For

example, the ability to make inferences depends on the readers' goals and the surface structure of the text in addition to their knowledge about the topic and about when inferences should be made (Perfetti et al.). Afflerbach found that when readers possessed background knowledge about a topic, their use of prediction strategies increased significantly across both fictional and expository text. Cain (1999) demonstrated that poor comprehenders showed weaker declarative and procedural knowledge of reading strategies than their peers who were more skilled comprehenders. Perfetti et al. cautioned that problems in reading should not necessarily be attributed to problems with strategy use per se, as a lack of knowledge can often appear as a failure to make inferences or to engage in metacognitive monitoring. If readers do not possess relevant world knowledge that they can call upon when processing new information, they are unlikely to recognize inconsistencies when they occur and thus are unlikely to engage in strategies to remedy their comprehension difficulties.

Thoughtful readers use prior knowledge constantly to evaluate the extent of meaning they have developed from a text (Farstrup & Samuels, 2002). This is true for readers of all ages and levels of sophistication. New information is learned and remembered best when it is integrated with relevant prior knowledge or existing schemata. It is important to realize that merely having prior knowledge is not enough to improve comprehension; the knowledge must be activated, thus requiring metacognitive awareness on the part of the reader (Bransford & Johnson, 1972). There are three kinds of prior knowledge that are activated by effective readers (Beers, 2003). The first kind is "specific knowledge," which relates to the topic of the text. For example, a text may be based on the habitat of a frog, and an effective reader would activate their specific

knowledge on the species of frogs. The second is referred to as “general world knowledge,” which stems from an understanding of social relationships and causal structures. This type of prior knowledge would be activated when a reader is confronted with a text that involves “Cowboys” and “Indians.” An understanding of the social relationship between Cowboys and Indians would activate general world knowledge which would be beneficial to the reader. The last type of prior knowledge relates to knowledge about text organization (Resnick, 1990). When students are confronted with a form of graphic text, it is important to activate their understanding of reading the titles and headings to develop an overall understanding of the text.

In this study, the program sessions incorporate the three types of prior knowledge within the different forms of text (i.e., narrative, informational, graphic). Specific knowledge and general world knowledge are addressed in informational and narrative texts, and text organization is addressed in graphic texts. The type of prior knowledge that is most prevalent in this study is specific knowledge, which relates to the topic of the text. Therefore, the ability to activate specific knowledge to the topic within the text would be most beneficial to the success of the program.

A study conducted by Lipson (1983) explored the influence of religious affiliation on children’s memory for text information. In this study, Lipson varied the background knowledge of readers who were all given the same passage to read. The subjects were Jewish and Catholic students in grades 4, 5, and 6. All were classified as good readers but differed in their knowledge of Jewish and Catholic ceremonies. The passages included one entitled “Bar Mitzvah” and the other “First Communion.” The Catholic students were asked to read the First Communion passage faster than the Jewish

students. Lipson reported the number of pieces of information correctly recalled (text-explicit recall), the number of correct inferences (inference recall) and the number of errors (error recall). The readers recalled more text-explicit information, made more inferences, and made fewer errors on passages for which they possessed a large amount of prior knowledge than on passages for which they did not.

A number of other studies have been conducted over the past 20 years to demonstrate how prior knowledge facilitates comprehension (e.g., Anderson & Pearson, 1984). For example, in a series of studies by Bransford, Vye, and Stein (1984), good and poor fifth-grade readers were asked to identify anomalous information in text and then to generate elaborations of text segments to help improve their recall. Good readers were successful at identifying anomalous information and at creating helpful elaborations. Poor readers, on the other hand, could not identify anomalous information. Their responses suggested that they attended to surface rather than deep structure features of the text. Poor readers could, however, be taught to use their general world knowledge to identify anomalous information and to generate elaborations that helped them remember better.

Another study by Leslie and Recht (1988) investigated how prior knowledge influences the amount of short-term nonverbal and verbal memory and long-term retention in students of high and low ability in reading comprehension. Junior high students were divided into four groups based on their preassessed reading ability (high or low) and preassessed amount of existing knowledge about baseball (high or low). Each subject silently read an account of a half inning of a baseball game. After reading, each subject recalled the account by moving figures and verbally retelling the story. The

findings replicated the vast majority of research on the effect of prior knowledge on memory. On all measures, children with greater knowledge of baseball recalled more than did children with less knowledge, and what they recalled was more similar to what the experts recalled. This finding, that summarization of poor readers with high knowledge of baseball was far superior to that of good readers without such knowledge, demonstrates the powerful effect of knowledge on memory.

Many studies have shown that students with prior knowledge of a topic recall significantly more information from text than do students with little or no prior knowledge (Hall, 1990; Kintsch, 1988). Proficient readers use prior knowledge to evaluate the adequacy of the model of meaning they have developed to enhance and make personal their interpretation of text and to store newly learned information with other related memories (Pearson, Roehler, Dole, & Duffy, 1992).

Making Connections

The structure of a typical middle school day is comprised of short periods of instruction where students are rushing to and from class and are expected to switch their attention from one subject to another within a very short time frame (Tovani, 2000). For those students who struggle with reading, this structure may limit their ability to make connections between new information and their own experiences. By ignoring the connections that exist between new material and previous experiences, comprehension is impaired (Tovani). Poor readers often attack unfamiliar content without considering whether they possess prior relevant knowledge and how they can connect it to the text they are reading (Harvey & Goudvis, 2000). This strategy of making connections is vital to good comprehension (Keene & Zimmerman, 1997). Reading teachers have known for

years that information is best remembered when it is connected to readers' background knowledge and prior experiences. Background knowledge can be defined as a storage of knowledge that provides the reader with an assortment of information (Tovani).

Background knowledge is a repository of memories, experiences, and facts. When information is read in isolation and not connected to existing knowledge, it is forgotten and deemed unimportant. Calling on existing knowledge and experiences is crucial if readers are to assimilate new information (Tovani). Not only does it help the reader remember what they have read, but they are more likely to empathize with the content, draw inferences, ask questions, and make comparisons and contrasts when such knowledge is activated. For these reasons, teachers have an important role in helping students acquire new knowledge. It is vital for teachers to explicitly model the strategy of making connections and provide students with ample opportunities to practice the strategy of connecting the new to the known information on their own.

Good readers are able to make these connections while reading text. Studies have shown that reading comprehension improves significantly when students have been instructed to make connections when reading (McNamara et al., 1996). In one study, the strategy of making connections was investigated across two groups of students in grades 1-9 (Spires, Gallini, & Riggsbee, 1992). In these studies, connections were activated for the experimental group by asking students to think about topics relevant to the passage, by teaching relevant knowledge, and by having students predict what would happen based on personal experiences. The other group of students received no instructional teaching on making connections. The findings revealed that students' recall and

achievement on standardized tests was significantly higher in the group of students who received instruction on making connections.

Mental Imagery

The strategy of mental imagery has been shown to improve comprehension, memory, and the interpretive understanding of text. Studies have shown that mental imagery facilitates the reading comprehension of both children and adults (Guttman & Levin, 1977; Piaget & Inhelder 1971; Shimron, 1975). Using mental imagery can help clarify meaning and encourage comprehension monitoring (Gambrell & Bales, 1987). When readers construct mental representations, the dual processing of both print and images may result in the reader expending additional effort, which results in more in-depth processing of the text (Sadowski & Paivio, 1994). Creating visual images also helps readers monitor their understanding of the text by relying on the images that are developed in their minds. If the images help create an understanding of the text in the readers' minds, then comprehension has occurred. However, if images are not formed, then readers cannot rely on mental imagery as a strategy that would enhance comprehension. The use of mental imagery is one strategy that struggling readers should be encouraged to use.

A study by Gambrell and Bales (1986) investigated the effects of mental imagery on the comprehension monitoring of fourth- and fifth-grade poor readers. Students were asked to read passages that contained obvious inconsistencies. Prior to reading the passages, one group received instructions to make pictures in their mind to help them understand and remember the passage, and the other group received instructions to do whatever they could to help them understand and remember the passage. All students

were instructed to comment if the passage contained information that was difficult to understand. The most significant finding was that students who were instructed to create mental images were more successful at identifying text inconsistencies than were their peers. Also, 70% of the participants in the imagery group reported that they made mental images about what they were reading, whereas less than 1% in the control group reported using mental imagery. Thus, the researchers concluded that imagery may be a particularly effective strategy for poor readers to employ when more in-depth processing is necessary for complete and adequate comprehension of text.

Studies by Belcher (1984), Gambrell (1982), and Pressley (1998) have documented that elementary-age students know how to create mental images and that only brief training and teacher modelling is necessary for most children to use mental imagery effectively as a reading comprehension strategy. There are various strategies and tools that can be modelled to students that can assist in their use of mental imagery as a strategy for increasing reading comprehension. One of the most common is the use of high-image-evoking text, which provides students with opportunities to create images during read-alouds of both narrative and informational text. Providing students with specific directions, depending on whether the text is narrative or informational, is also helpful. For example, instructions like “make pictures in your mind of the interesting characters in this story” or “make pictures in your mind about events that occur in the story” can encourage students to integrate information across text so that they can engage in the constructive processing of text information.

Another common procedure used to teach imagery as a comprehension strategy is the think-aloud. In this procedure, the teacher verbalizes thoughts about using imagery

while reading a passage aloud to students. Short passages that are high in image-evoking language have been shown to be effective in stimulating the use of imagery (Gambrell & Bales, 1987). As the teacher reads the passage aloud, the students follow along silently, listening to the text as the teacher thinks aloud and comments on his or her use of imagery.

Readers who have been exposed to the strategy of imagery have shown an increase in comprehension when reading (Sadowski & Paivio, 1994). For example, Pressley (1996) gave 8-year-olds practice at forming images and then provided feedback using examples of good images. Both the treatment group and the controls then read a story. The children trained in imagery performed significantly better on questions about the story than did the controls.

Imagery has been shown to be an effective comprehension strategy for a range of learners, especially for less proficient comprehenders (Block et al., 2002). In fact, less proficient comprehenders benefit most from instructions to use imagery because they tend not to spontaneously induce images or internalize strategic reading behaviours unless they have explicit instruction and guided practice (Gambrell & Jawitz, 1993). Instruction for these students must emphasize the active engagement of the reader in purposefully and selectively applying the imagery strategy across appropriate reading situations. Teachers can take advantage of children's natural ability to create images and teach them to use the imagery strategy for enhancing comprehension. With practice, students can learn to use imagery independently while reading.

Proficient readers have also been shown to use the comprehension strategy of imagery spontaneously (Pressley, 1996). The images are created both during and after

reading and are rooted from their prior knowledge and may include visual, auditory, and other sensory images as well as emotional connections to text. The benefits from this strategy include the ability to draw conclusions and create unique interpretations of text. As a result, the images that arise from the reader's personal experience frequently become part of the reader's enhanced comprehension and supply rich detail while reading. This provides the reader with more depth and dimension to the reading, engaging the reader more deeply and making text more memorable.

Text Structure

Structural aspects of text can have a profound influence on the subsequent comprehension of text. The surface structures (bold, italics, headings, font size) that are found in text play a significant role in helping readers understand and form a deeper understanding of the text content (Zwaan & Radvansky, 1998). They also help readers form connections amongst the concepts that are related in texts. There are other forms of surface structures that tend to be explicit and can include graphic and typographical cues (e.g., layout and font style) and can help the reader form organizational and logical relations among the text elements. In other words, linguistic and graphic cues have the potential to guide readers' processing of the underlying coherent relations expressed in the text. However, for the potential to be realized, readers must be aware of the relevance of the cues and make use of the organizational information (Goldman, Cote, & Saul, 1995).

The distinctive graphic properties associated with titles, headings, subheadings, and paragraph spacing highlight the overall structure of text for the reader. Other forms of graphic cueing rely on distinct font style (e.g., boldface, italics, underlining) to mark a

word, phrase, or a sentence as “special” in some way. These kinds of cues can be used in different ways depending on the conventions adopted by the author. For example, they may indicate important concepts or add emphasis to terms.

At the discourse level, research on narrative and expository text demonstrates the importance of text-based structure to processing, remembering, and making judgments. Research has concluded that structural cues can improve identification of main or important ideas as well as increase their memorability (Alexander & Jetton, 1996). Text structure is one way that readers identify the main points and important ideas in a text (Alexander & Jetton). For example, typographical features such as bolding or italicizing are processed longer and recalled better than unsignaled information (Golding & Fowler, 1992).

It has also been suggested that parallels between the surface structure of text and the underlying conceptual structure of information can facilitate readers’ comprehension. For example, when typographical features match the content of the text, performance is better on comprehension questions (Ohtsuka & Brewer, 1992). Furthermore, when the surface text structure and the underlying conceptual structure are parallel, that is, when they match, texts are more comprehensible for readers. “Simplifying” texts by removing these structural cues (bold, italics) and making shorter sentences can make the texts harder to understand because these techniques remove the links that provide parallel surface and conceptual meaning. However, care must be exercised when considering using text structure as a reading strategy because while there is improved memory and comprehension for the signaled content, there is no effect or at times a negative effect for the comprehension of unsignaled content (Lorch, 1989).

Research has shown that students who rely on text structure have enhanced comprehension of written text. The focus on titles, headings, boldfaced words, and pictorial information aids in generating an understanding of the content within a text. For these reasons, the awareness of text structure as a strategy is important in developing students' reading ability and comprehension.

Study Skills in Reading

Testing students is a prominent feature in all levels of the education system. Tests come in many forms; some are formal and others are informal, their length can vary from minutes to hours, and the students' collective performances on them can result in passing or retention. There is considerable variability in the purpose of testing. Both formal and informal tests are given to assess student achievement. Often tests serve as a diagnostic function by allowing teachers to adapt their lessons to accommodate students' areas of weakness. On other occasions tests can determine whether students will graduate with a high school diploma. The performance on the Ontario Secondary School Literacy Test (Education Quality and Accountability Office, 2004) is an example of a test that determines whether students will graduate from high school. For this reason, this test has created an enormous amount of anxiety and stress in students in the intermediate grades (Rowe & Rowe, 2002). With intermediate grade teachers being called upon to teach the study skills that are required in order to perform successfully on such tests, it is important to consider cognitive strategies that might improve students' test performance.

Students' test performance is a product of two related cognitive processes: encoding and retrieval. Encoding relates to the cognitive processes that are engaged when students first encounter information. The majority of test taking skills are classified

as encoding skills because they help the learner to “store” information in memory.

Retrieval is the other process involved in test taking. This process involves transferring information from our long-term memory into our short-term memory so that it can be used to respond to present demands namely answering test questions (Wood, Woloshyn, & Willoughby, 1995). Retrieval is partly contingent on encoding processes because the success of “finding” the stored information will depend on the type of strategy used to “learn” the information. Specifically, the effectiveness of the strategy will determine how much of the original information was stored (Wood et al.). The focus of this section is to examine the study skills that can facilitate students’ performance in test taking situations.

Not all tests are structured the same. Testing formats can include any combination of the following types of questions: multiple choice, forced choice (true or false), or short answer (Schmidt, 1983). The perceived difficulty of these questions matches their cognitive demands with multiple choice and forced choice perceived as the easiest to answer and short answer perceived as the most difficult. Regardless of the kind of test the learner encounters, there are some general test taking behaviours that students can acquire in order to enhance their performance. Based upon the findings of a number of educational researchers, Putnam (1992) suggested that students should be instructed to read all directions and questions carefully, attempt to answer every question, and feel free to ask for clarification at any time they are uncertain or do not fully understand a question.

Although there are many guides that describe various procedures for enhancing performance on multiple choice tests, there is very little research that systematically

examines the impact of the procedures in test situations (Wood et al., 1995). One of the most common strategies mentioned is to encourage students to read all of the instructions and questions carefully (Putnam, 1992). They are also to scan the test to determine the type of questions and search for key words that will help them understand how to best respond. Next, they read the question for meaning. At this point they should search their available knowledge for relevant information that will help them to eliminate responses that are clearly incorrect. This procedure is to be repeated for each multiple choice question. As they are working through the test, students are also encouraged to attempt to answer all questions, but if they encounter difficulty when attempting an answer, they are encouraged to skip the question until all of the “easier” questions are answered first (Putnam). It is suggested that students can return to the more difficult questions later when they review their work.

There is also research supporting a preference for answering easy questions prior to difficult ones. Allison and Thomas (1986) compared elementary, junior, and senior high school students in their performance for answering items that varied in difficulty. The majority of students at all ages preferred easy questions first followed by difficult ones relative to the presentation of difficult questions before easy ones. To make tests more comfortable and to remove one step in the test taking routine, educators could arrange test items in an ascending order from easier to more difficult items (Wood et al., 1995). All of the test taking skills mentioned are effective because they provide students with a systematic set of procedures to use when approaching any type of test question. Following the test taking strategies in a sequential order should benefit the students and provide a consistent approach to each type of test question. This approach should

provide students with more confidence when confronted with various types of questions and enable them to develop a sense of assurance in their final answer. The program used for this study encourages the use of each of these strategies mentioned above when confronted with any type of comprehension question.

Educators can facilitate students' performance on multiple choice tests by providing students with the same types of questions that students should expect to find on a subsequent exam (Wood et al., 1995). Providing students with a program that incorporates the use of the strategies for various types of reading comprehension questions would be of great value and importance in preparation for the Ontario Secondary School Literacy Test (Education Quality and Accountability Office, 2004).

There is evidence of practice effects when students are provided with study questions that parallel the kinds of questions that will appear on later tests (Lundeberg & Fox, 1991). For example, if a history test involves verbatim recognition of dates and events, then verbatim questions should be presented in a practice quiz or study questions. If students are required to analyze or interpret historical events, then the practice or study questions should involve analysis or interpretation questions. In other words, it is not sufficient to tell students to expect a multiple choice test. Students must be familiarized with the types of questions that will be given in order to demonstrate improved performance (Lundeberg & Fox).

The program that will be administered in this study will follow this same principle of exposing students to study questions that will appear on future tests. This will be done to ensure that students have had the necessary exposure to different types of questions for the purpose of evaluating reading comprehension.

In addition, effective test taking strategies should include techniques that reduce anxiety as well as facilitate cognitive performance (Paulman & Kennelly, 1984). Ideally, the more information students have about the test, the easier it will be for them to execute appropriate encoding and retrieval strategies and the less anxiety they will experience (Paulman & Kennelly). Educators also should encourage students to regulate both their cognitive and affective test behaviours with the goal of becoming more self-directed in their learning.

In order for students to achieve success on any type of reading comprehension test, a number of strategies must be taught to ensure they have developed the skills that are necessary to perform optimally. Expanding this repertoire from teaching the strategies required to read different types of text, to the test taking skills and recall that are necessary when responding to reading comprehension questions are all vital skills that need to be taught for students to achieve success on any form of testing. The ability to teach and explicitly model each of these strategies in a sequential and efficient manner is the key in developing a foundation of knowledge that students can apply to any testing situation that focuses on their reading comprehension.

Effective Strategy Instruction

Teaching instruction of effective reading strategies has shown to be valuable in providing students with a repertoire of strategies that will benefit their overall level of comprehension (Block et al., 2002). The explicitness with which teachers teach these strategies makes a difference in learner outcomes, especially for students who are low achieving and who profit from greater explicitness. Results of the immediate impact of instructional programs have been quite positive, but we have less positive evidence that

students continue to use the strategies in the classroom and outside of the school after the conclusion of the instruction (Ringel & Springer, 1980) or that they transfer the strategies to new situations. Recent studies have underscored the importance of teacher preparation when the goal is to deliver effective instruction in reading comprehension strategies (Brown, Pressley, Van Meter, & Schuder, 1996). This is especially important when the students are low performing. Implementation of a single direct approach to cognitive strategy instruction in the context of the actual classroom has proved problematic. Proficient reading involves much more than using individual strategies. It involves the constant ongoing adaptation of many cognitive processes. Intensive teacher preparation has been shown to be effective in teaching teachers to deliver successful strategy instruction, and this has resulted in improved student outcomes on reading comprehension tests.

Explicit Instruction

Extensive research exists on the use of various strategies to increase students' reading comprehension abilities. Mastropieri and Scruggs (1997) suggested that similarities existed among the studies which demonstrated positive results. The authors suggested that comprehension generally increased when teachers provided explicit instruction to students, which includes modelling, guided practice and feedback, attributional instruction, and monitoring of students' progress. These findings echo those of Pressley, Goodchild, Fleet, Zajchowski, & Evans (1989), who found that effective models of instruction used by various researchers all emphasized teaching a limited number of strategies, one at a time, and ensuring that each strategy is taught well. These

authors called for extensive and intensive explicit instruction which allows for much practice with teacher feedback.

Studies have shown that comprehension improves when teachers provide explicit instruction in the use of comprehension strategies. Bauman and Bergeron (1993) posed the question, “Can children be taught to use story structure to enhance their ability to identify and recall central story elements?” They compared four classes of grade 1 students. Two classes were provided with explicit instruction in identifying key elements of stories: characters, setting, problem events, and solutions. The other two classes listened to and read the same stories but were not taught any specific reading strategies. Groups taught to attend to key aspects of stories outperformed students who engaged only in reading and discussing the stories on all measures employed, including identifying the most important parts of a story and selecting a good summary of a story.

Metacognitive Knowledge

Providing explicit instruction and modelling is the most effective method of teaching students strategies that will improve their comprehension skills (Perfetti & Curtis, 1986). Pressley and Goodchild (1989) stressed that “good strategy users” also possess metacognitive knowledge about strategies. Metacognitive knowledge includes an understanding of when, where, and how to apply the strategies which are taught through explicit instruction. These researchers advocate that teachers explain and model strategic procedures and provide guided practice and corrective feedback when students use strategies. It is important to provide students with explicit instruction which gives them the knowledge of when and where to use specific strategies. Instructional recommendations from multistrategy programs suggest that strategy use should be

introduced through teacher modelling and providing opportunities for students to take responsibility for their own strategy use in a gradual manner. The teacher who is able to incorporate effective strategy use through explicit instruction will help students not only to learn specific procedures to attain academic goals but to become more actively engaged in their own learning (Harris & Pressley, 1991).

Explicit Instruction and Memory

The literature clearly demonstrates that students who receive explicit strategy instruction and who learn to engage in strategy use “before,” “during,” or “after” the reading of a text can increase their understanding and memory of a passage. Whether this increase in reading comprehension results from the facilitated construction of a complete and well-integrated representation of the text in memory, the building of important background knowledge, and/or a reduction on working memory demands is not yet clear. Currently, there exists little research which examines teaching students a repertoire of strategies to facilitate reading comprehension, despite the findings that good readers possess a repertoire of strategies which they are able to apply flexibly in different learning situations (Pressley & Woloshyn, 1995). The few studies which do exist (e.g., Brown et al.; Palinscar & Brown, as cited in Pressley & Woloshyn) have demonstrated that providing students with multicomponent strategies can lead to increased reading success.

Research has shown that students learn best when strategy instructions are explicit and coupled with authentic learning tasks (Woloshyn & Elliott, 1998). The components or steps of explicit instruction follow a series of steps that is also referred to as direct instruction (Gaskins & Elliott, 1991). Students are first introduced to a strategy in which

the teacher provides information on and allocates a substantial amount of time for modelling. Eventually, when students can carry out the strategy proficiently, teachers can limit their input to reminders and prompts to transfer this skill when completing related learning tasks. Throughout the process of explicitly teaching a strategy, teachers must continually monitor students' progress, providing them with encouragement and constructive feedback. At any time, a teacher may decide to remodel the strategy, and from this perspective the components of explicit strategy instruction are more accurately described as "interactive" or "interdependent" (Woloshyn, Elliott, & Kacho, 2001). Alternatively, when they prompt students to transfer a strategy to a new learning task, they are also defining the parameters associated with its effective use. Teachers need to emphasize that the use of strategies fosters higher comprehension, greater world knowledge, and increased academic success (Pressley & Woloshyn, 1995). The end goal of strategy instruction is having students who are able to use a variety of strategies independently, flexibly, and effectively.

Teaching a Repertoire of Strategies

Studies have shown that good readers do not rely on only one strategy but use several in a co-ordinated fashion to ensure success in reading comprehension (Cain, 1999). Thus, the long-term goal of reading strategy instruction is to have students who are able to use a variety of internalized strategies flexibly when they encounter difficult textual materials (Pressley & Woloshyn, 1995). Therefore, teaching a repertoire of strategies is the key for achieving success in reading comprehension. Combining the use of a variety of strategies provides the reader with a more elaborate foundation in discovering the meaning behind any written form of text.

Reading Comprehension Strategies and Test Taking Skills

A large portion of the Ontario Secondary School Literacy Test (Education Quality and Accountability Office, 2004) is devoted to reading comprehension, where students are expected to read, understand, and answer reading comprehension questions.

Presumably, students who actively apply comprehension-based cognitive strategies are at a definite advantage compared to more passive students. The challenge for teachers is to encourage “passive” readers to take a more active role in their learning. This can be done by modelling explicitly the repertoire of “before,” “during,” and “after” reading strategies in combination with test taking skills that can facilitate students’ comprehension of reading and improve overall test performance.

Summary

The importance of providing effective strategy instruction in reading comprehension cannot be underestimated by today’s educators. Incorporating instructional strategies that develop components of good comprehension is crucial to the overall success of young readers. The reliance on prior knowledge, making connections, mental imagery, and text structure are essential strategies that should be explicitly taught to children during all stages of their reading skill development. Modelling these reading comprehension strategies will further enhance their understanding of various forms of written material.

With the increased demand of successful performance on literacy tests throughout our education system, the teaching of test taking skills has become equally important. Therefore, the ability that educators have in effectively teaching a repertoire of reading

comprehension strategies in combination with test taking skills is vital to students' overall success throughout their educational careers.

Present Study and Hypotheses

The purpose of the current study is to examine the effectiveness of providing students with explicit instruction versus implicit instruction on a combined learning strategy of reading comprehension and test taking skills. Specifically, students' performance on answering different types of reading comprehension questions is compared with the effectiveness of implicit versus explicit instruction.

Research has shown that explicit strategy instruction and extensive teacher modelling of effective strategies can be helpful in teaching all students, including those with reading difficulties (Pressley & Wharton-McDonald, 1997). Activating the most appropriate "before," "during," and "after" reading strategies combined with the ability to determine the type of question and its required response are vital skills and play a significant role in overall test performance. To date, there has been relatively little research examining the potential of providing students with a combination of strategies in preparation for the grade 10 literacy test. The current study examines whether explicit instruction and modelling of reading comprehension strategies and test taking skills will be beneficial in improving comprehension skills and the ability to detect and answer different types of questions in grade 8 students. This combination strategy is compared with the effectiveness of implicit instruction which consists of a general discussion and overall review of the strategies.

Students will be randomly assigned to either the implicit or explicit instructional condition. Students in the implicit group will be measured by their performance on

reading comprehension questions following simple discussion and review of the strategies. Students in the explicit group will be measured by their performances on the same reading comprehension questions following teacher modelling. Students' comprehension will be measured through the use of comprehension questions (direct, inferential, critical) administered after each instructional session. Four hypotheses are associated with this study:

1. Students in the explicit instructional group will demonstrate greater comprehension (as measured by their scores on the written comprehension tests) compared to students in the implicit instructional group.
2. Students in the explicit instructional group will demonstrate more effective test taking skills (as measured by their scores on written comprehension tests) compared to students in the implicit instructional group.
3. Students in the explicit instructional group will demonstrate greater metacognitive awareness when reading and responding to text material (as measured by their scores on the written comprehension tests) compared to students in the implicit instructional group.
4. Students in the explicit instructional group will show greater improvement in reading comprehension performance over the course of the study (as measured by their scores on standardized tests) as compared to the implicit instructional group.

CHAPTER THREE: METHODOLOGY AND PROCEDURES

This chapter provides an overview of the methodology employed in the current study. Specific information about the selection of students, materials, data collection, analysis, and experimental procedure are presented here. This chapter concludes with a brief discussion of the methodological limitations inherent in this study.

Rationale for the Study

Studies have shown that students with reading difficulties often fail to use the “before,” “during,” and “after” reading strategies that are essential in improving comprehension (Guthrie & Davis, 2003; Janzen 2003; Nist & Simpson, 1996). For this reason, many students have difficulties in reading and therefore struggle when required to form an understanding of written text. Consequently, this can result in difficulties when responding to reading comprehension test questions. Numerous strategies must be relied upon in order for students to develop the skills required to comprehend what they read and effectively respond to test questions. Specifically, combining the use of “before,” “during,” and “after” reading strategies with the understanding of how to detect and approach the three types of reading comprehension questions (direct, inferential, critical) is key to successful reading comprehension and overall test performance. Research has shown (Pressley & Wharton-McDonald, 1997) that explicit strategy instruction and extensive teacher modelling of effective strategies can be helpful in teaching all students, including those with reading difficulties. Activating the most appropriate reading strategies while studying text, combined with the ability to determine the type of test question while responding, are vital skills and play a significant role in determining students’ academic achievement, especially on standardized tests (Putnam, 1992). The

students in this study all attended the same inner-city public school and the reading scores from the Education Quality and Accountability Office indicated that the reading level of this group of students was functioning well below their grade level expectation.

Therefore, this study was designed in order to provide students with effective reading strategies and test taking skills that would benefit them when responding to various forms of text. The effectiveness of providing students with a repertoire of reading comprehension and question answering strategies was compared in an implicit versus explicit fashion.

Research Design Overview

The current study received approval from Brock University's Research Ethics Board (see Appendix A). Figure 1 presents an overview of the research design. After receiving parental consent, students' reading level was assessed using the standardized Canadian Achievement Tests, Third Edition (CAT/3) Reading Assessment. The scores from this pretest were used to assess whether the two groups of students differed significantly with respect to their reading level. The two classes of grade 8 students who participated in the study were then assigned by a coin toss to one of two study conditions: one class received implicit instruction; the other explicit instruction. This experimental design allowed for both within-group and between-group analysis so that the effectiveness of both types of instruction could be examined in light of students' reading abilities.

The program consisted of 10 whole-group sessions which focused on a variety of reading comprehension strategies and test taking skills. Students in both groups were taught in the exact same manner throughout each instructional session. The only



Figure 1. Overview of the current study's methodology, showing the sequence of steps as it is presented to students in both instructional conditions.

difference between the groups was the form of instruction that was given at the end of each session. One group of students received implicit instruction where they were responsible to answer two sets of reading comprehension questions based on the instructional session. Once the first set of questions was answered, a class discussion and “take up” of the activity took place. The other group received explicit instruction where the researcher modelled the reading of the text and the answering of the first set of reading comprehension questions. The explicit group was then responsible for answering the second set of reading comprehension questions independently. The 10 whole-group sessions were led by the researcher, who was their qualified Language Arts Teacher and who had experience working with children in the classroom setting, including those with learning difficulties.

In the whole-group sessions, the researcher explained to the students that each session focused on reading a specific type of text (i.e., narrative, informational, graphic) and how to use specific strategies that would help them form a better understanding of what they had read. The other part to each session involved the teaching of three types of comprehension questions (direct, inferential, critical) and the skills that would help in correctly identifying and answering them. The students were provided with two sets of comprehension questions for each text. The implicit group received implicit instruction and was required to answer both sets of questions independently, whereas the explicit practice group had the first set of questions modelled to them and then were responsible for completing the subsequent set independently. The answers to the questions served as formative tests throughout the study, and a comparison was made based on the performances between both groups.

Upon completion of the 10 sessions, both groups completed three summative tests (narrative, informational, graphic) that provided them with an opportunity to use the strategies taught throughout the program. Comprehension was measured by students' performance on each of the tests. Last, students in both groups completed an alternative version of the CAT/3 standardized reading assessment. The test was administered in their regular classroom to determine whether any improvement in reading comprehension had occurred as a result of the program delivery.

Design

This study was based on a quantitative approach using a quasi-experimental design (Creswell, 2002). The design of this study was chosen to determine the effects that teaching instruction (implicit and explicit) had on students' reading comprehension and test taking performance. Since the students were grouped into two separate classes, it was not possible to randomly assign each student to one of the two study conditions. Therefore, the students from two existing grade 8 classes were assigned to one of two instructional groups. Through a coin toss, one class was assigned as the implicit group and the other class as the explicit group. The researcher obtained data from both groups in order to determine the extent of learning that had occurred between and amongst them. These data served as a comparison to determine the growth of learning that had taken place between the two groups of students.

Variables

The study consisted of one independent variable: the type of instruction within each session (implicit or explicit). The dependent variables or learning measures that were assessed throughout the study consisted of the Canadian Achievement Test (CAT/3)

that was administered prior to the onset of the study (pretest) and after a delayed period of its completion (posttest), the ongoing formative tests delivered within each session along with the summative tests that were administered immediately after the program had been delivered.

Selection of Students and Group Formation

Two grade 8 classes from an inner-city public school were involved in this study. The implicit and explicit groups consisted of a total of 50 students. The chronological age range of the students was 13 to 14 years, with 33 male and 17 female students. No attempt was made to exclude students who were identified as having learning exceptionalities. The CAT/3 pretest was completed to assess whether the two classes of students differed significantly with respect to their initial reading levels. Once consent had been obtained from the parents/guardians of each student, the initial standardized CAT/3 reading assessment pretest was administered to both groups. One class of students was referred to as the “implicit group” and the other class of students the “explicit group.” The test took 35 minutes to complete, and instructions were provided to students prior to its delivery. (See Appendix B for the list of instructions provided to students.) Students who did not return a consent form or whose parents indicated that they did not wish their children to participate in the study completed the same reading comprehension program as part of their provincially mandated curriculum but did not have their performance scores included as part of the data set associated with this study.

Instrumentation

This section provides information on the instrumentation of the dependent measures.

Canadian Achievement Test (CAT/3)

The CAT/3 was standardized on a sample of approximately 50,000 students from grade 2 to grade 12 in a stratified random sampling of public, separate, private, and band schools from all 10 Canadian provinces. “The target population to which the norms were intended to apply included all schools in Canada in which English was the language of instruction” (Canadian Test Centre, 2002a, p.17). The reliability coefficient (KR20) of the reading comprehension subsection of the CAT/3 for grade 8 students was 0.91. This measure of reliability for the CAT/3 is one of its major strengths (Lurkin, 1998).

The CAT/3 test was based on the Comprehensive Tests of Basic Skills, Fifth Edition (CTBS/5), and items were reviewed by educators across Canada to ensure the relevancy of items to Canadian students. Canadian teachers created another 1,000 items which were tested in an item tryout on 5,000 students in 2001. Items which appeared unclear or biased were eliminated so that only validated items remained in the final pool of questions (Canadian Test Centre, 2002a). All items were reviewed for ethnic, racial, and gender bias. The *CAT/3 Handbook for Coordinators* (Canadian Test Centre, 2002a) states that “the content validity of the CAT/3 can be checked by comparing the content descriptions and the test items to particular curriculum objectives” (p. 50). In developing the tests, the authors reviewed many curriculum guides and met with teachers and curriculum experts. Items in the CAT/3 are thus said to reflect a wide content base which

represents comprehensive curriculum areas. It is important to note that overall there is not extensive coverage of the test's validity in the provided manuals. In a review of the test, Hattie (1998) states that "although the test package is over 3 inches thick, there is almost no mention of validity" (p. 174). Since the CAT/3 test items appear comparable with objectives from the Ontario Curriculum, it is expected that the test will provide a valid measure of students' reading ability.

Students' initial reading ability levels were determined by using the reading subsection of the standardized Canadian Achievement Tests, Third Edition (CAT/3). The reading comprehension test was administered to both groups of students in a whole-class session. The goal of the comprehension subtest was to measure the students' ability to construct meaning and to expand it in many ways. This subtest consisted of a series of stories that students were to read and comprehend. Questions which accompanied each passage were designed to allow students to demonstrate their knowledge of main ideas and concepts. While completing the comprehension questions, students were required to recall information that was stated in the text explicitly, in addition to identifying key events or ideas and making interpretations about characters' feelings. The administration guide stated that the comprehension portion of the CAT/3 has a time limit of 35 minutes (Canadian Test Centre, 2002b) and contained two equivalent sections which were used to measure students' performance on two different occasions. In the present study, this subtest was administered to students in both groups in order to determine their reading levels. (Refer to Appendix C for sample questions from the CAT/3 test.)

Canadian Achievement Test (CAT/3) Pretest

The first part of the Canadian Achievement Test (CAT/3) was classified as the pretest and was administered to the students prior to the onset of the study. Students' scores on this test resulted in an overall reading comprehension score that was used to determine whether the two classes of students possessed the same reading level.

Canadian Achievement Test (CAT/3) Posttest

The second part of the Canadian Achievement Test (CAT/3) was classified as the posttest and was administered to students 3 months after the completion of the program. The purpose of the posttest was to determine whether students had improved their reading comprehension skills as a result of the program delivery.

The After-School Enrichment Program: Rationale

The lessons that were provided to students in both groups were adapted from an After-School Enrichment Program developed by the Continuing Education Department from the Durham District School Board. The focus of the program was on improving reading comprehension and test taking skills in preparation for the Grade10 Literacy Test. It was developed in January of 2003, and written approval was obtained from the Durham District School Board in order to reproduce the materials for this study.

The program was designed for at-risk intermediate students who will be writing the Ontario Secondary School Literacy Test (OSSLT) or for students who had already written the OSSLT and are aware that they had failed the reading portion of the test. Since the participants in this study were grade 8 elementary students, the focus of the program was to strengthen their reading comprehension skills in preparation for the Ontario Secondary School Literacy Test.

The revised program used in this study consisted of 10 sessions, each 1 hour and 15 minutes in length. All sessions placed an emphasis on the “before,” “during,” and “after” reading strategies required to read narrative, informational, and graphic text. The other emphasis of the program was to teach students to detect and apply skills to answer the three different types of reading comprehension questions (i.e., direct, inferential, critical). The effectiveness of such a combined learning strategy should benefit struggling readers who fail to rely on the strategies that would enable them to develop a better understanding of written text and respond to reading comprehension questions. The focus of this program was to help students understand how test questions are best addressed. Presumably, internalizing these thought processes would help them understand the process that is involved when reading and interpreting written text. These reflective skills are vital for success on the Ontario Secondary School Literacy Test and any other types of structured reading comprehension tests.

Program Sessions

Both the implicit and explicit groups of students were participating in the program sessions during the instructional school day. The duration of each session took approximately 90 minutes to complete and was instructed to students when they had a scheduled double language period on their timetable. Refer to Figure 1 for an overview of the study’s methodology. The program that was delivered to both the implicit and explicit groups consisted of 10 whole-group sessions. Each session in the program emphasized specific reading strategies that were critical for processing the three different types of text (i.e., narrative, informational, graphic). In addition to the strategies, the sessions also focused on the test taking skills that helped students identify and answer the

three types of reading comprehension questions (i.e., direct, inferential, critical).

Collectively, the repertoire of reading strategies and test taking skills offered in the program taught students the skills that are required to prepare and successfully complete the Grade 10 Literacy Test or any other standardized reading comprehension test. (Refer to Appendix D for a sample of Sessions One and Two).

Session One

In the **first session**, the students were given a chart that provided them with an overview of the reading strategies that skilled readers use “before,” “during,” and “after” reading. To introduce the reading strategies, the researcher discussed what was involved in being a skilled reader and then modelled how good readers process text. The reading strategies listed in the chart were modelled in order for students to become familiar with them. Each student received a copy of the story that the researcher read aloud and modelled to the class. An overhead of the instructional story was also provided for students to follow along as the researcher modelled the reading. The story was written in two different fonts in order for the students to distinguish the content of the story from the reading strategies that were being used. The story was written in bold, whereas the thought processes and strategies modelled by the researcher were in italics. Following this, the class determined the strategies that were used and how they aided in the comprehension of the text. The students were then provided with the opportunity to practice the reading strategies that would benefit them while reading informational text. The implicit group was given two stories to read and apply strategies independently, whereas the explicit group was provided with a model for the first story and the second story was completed independently.

Session Two

In the **second session**, the students received a sheet entitled, “Steps to Answering Comprehension Questions.” The students learned about the three types of questions (direct, inferential, critical) that are found on the literacy test. They also applied a three-step strategy that was taught in this session to help them recognize the type of question. The first step required students to read the question carefully in order to ensure that they had a complete understanding of the item. The second step involved the underlining or highlighting of key words. The third step required students to determine the question type (i.e., direct, inferential, critical). Once they had determined the type of question, they were to provide an appropriate answer. Upon completion of this review, the students were provided with a series of reading comprehension questions to answer. The implicit group was given two sets of questions based on the same story, whereas the explicit group had the first set of questions modelled explicitly and the second set to answer independently.

For each session within the program, the questions were presented on a piece of paper with space for students to answer each question. Students were encouraged to try their best to answer each question and were informed that spelling and grammar did not count. In order to account for students’ varying reading abilities, the researcher read the questions aloud to the class. The researcher then circulated around the classroom and read the questions aloud to any students who required this assistance. The researcher did not provide assistance with any answers and did not answer any questions the students had pertaining to the quality or accuracy of their answers. All students were simply

encouraged to “do their best.” The structure of each of the remaining sessions followed this exact format, and each group was given the same instructions to follow.

Session Three

In the **third session**, the focus was on practicing reading strategies associated with the processing of narrative text. The students were responsible for recognizing the implied meaning that the author had provided in the text. The students were given a copy of “Application to Date My Daughter.” The students were required to read this text and use the clues in the written text to pick up on the implied meaning. Once they had relied on the clues provided, they were also required to transfer their own prior knowledge to the reading situation in order to understand the implied meaning. Next, the implicit group was given a parable entitled “The Butterfly,” with directions to discover the message of the parable. The students were encouraged to rely on the clues given in the text and their prior knowledge in order to develop an understanding of the parable. The students were told that the literal meaning was provided, and they were to determine the broader meaning the author was implying based on clues in the text and their knowledge of life. The second activity for the implicit group was the reading of a short story entitled “If Only.” The ending of the story was ambiguous, and the students were instructed to interpret how it ended. The explicit group had the parable “The Butterfly” explicitly presented to them and then were instructed to read the second story independently. The emphasis was to incorporate as many reading strategies as they believed necessary to help them better understand the story.

Session Four

In the **fourth session**, the students discussed and implemented more detailed skills when answering multiple choice questions. The focus of this session was to help students apply skills that would eliminate alternatives to the final answer. With multiple choice, there are four possible answers to choose from, and the skill of narrowing down the options to determine the most correct answer was vital. This session began with a reading addressing general test taking skills, with a greater emphasis on those specific to multiple choice questions. Following this, the teacher placed a list of instructions on the board in paragraph format. The students were then required to highlight the key words in the instructions. The students were also required to rely on their reading strategies chart in order to select the strategies that seemed most useful in this reading situation. When the students had completed the activity, they had to skim down the list and identify the skills that would be most useful to someone who had run out of time when writing the test. Once this activity was completed, the teacher read the handout entitled “Dealing with Multiple Choice.” The implicit group received two sets of questions relating to the “If Only” story. They were instructed to apply the skills they had learned when answering multiple choice questions. The explicit group had the first set of questions explicitly modelled by the researcher and were assigned the second set of questions to answer independently.

Session Five

In the **fifth session**, the focus was on applying the strategies of text structure and focusing on headings that will assist them when reading and interpreting graphic text (e.g., charts, labeled photos). The students were also given the opportunity to apply the

strategies of text structure and the reading of headings required to answer two types of comprehension questions (i.e., direct and inferential) relating to graphic text. The researcher began by modelling the use of a chart entitled “Preliminary Feedback for Students.” This chart illustrated a sample of reading results from the Grade 10 Literacy test across narrative, informational, and graphic text. Following this activity, the researcher modelled the reading and interpretation of a chart entitled “Trent University” on the overhead. This was supplemented with an Undergraduate calendar that consisted of descriptions of the courses listed on the chart. The researcher modelled the strategies of text structure and focused on headings to read the chart and then make decisions about enrolling in courses. The students then used the information to discover which of the Trent courses were offered in a secondary location. The students then were instructed to complete activities that required them to use the modelled strategies. The implicit group received two activities to complete independently. The first was a copy of a chart entitled “Canada Ski Guide” and corresponding questions. The second activity required them to read and interpret a more challenging, unfamiliar graphic text entitled “The Big Chute Marine Railway.” Students were encouraged to use relevant skills when responding to the comprehension questions provided. The explicit group had the reading and questioning pertaining to the “Canada Ski Guide” explicitly modelled by the researcher. The second activity involving questions relating to the “The Big Chute Marine Railway” were answered independently.

Session Six

In the **sixth session**, the focus was on applying the strategies of scanning the text and making connections that aid when reading and interpreting graphic text. The students also relied on the strategies learned to answer the three types of questions (direct, inferential, critical) relating to graphic text. As a group, a chart entitled “Five-Star Movie Rating” was modelled to ensure that students could read and interpret graphic information. The researcher modelled six details from the chart that would help students draw conclusions based on the data. The practice activities for this session required students to read and interpret four graphs. The implicit group was given all four graphs to record six details and four conclusions from each. The explicit group had one graph modelled explicitly and was then required to complete the remaining three independently.

Session Seven

In **session 7**, students read informational and narrative text to compare the reading strategies that were most appropriate for each type of text. The strategies of making connections to prior knowledge, mental imagery, and text structure were crucial in forming an understanding of the narrative text. When reading the informational text, the strategies of knowing why you are reading the text and scanning were most useful in forming an understanding of the text.

The students then received an informational text entitled “Common Characteristics of Bullying” and a narrative, “Jody and Tony.” They were responsible for examining each text to determine whether they would use the same reading strategies or different ones when reading both selections. Following this, the researcher modelled how they would approach the two reading selections. At this point in the session, students were

then given their practice activities. The implicit group was given two sets of questions (one for each story), and they were reminded to use the skills taught to answer the comprehension questions. The explicit group had the first set of questions modelled explicitly and then received the second set of questions to be completed independently.

Session Eight

In **session 8**, the focus was on using strategies to help understand more challenging informational text. The strategies that were stressed were recall of prior knowledge, text structure, making connections, and mental imagery. Students were also instructed to apply the knowledge they had on test taking skills relating to multiple choice questions. Students then received two sets of reading comprehension questions based on the informational text entitled “A History Book for History-Haters.” The students in the implicit group were instructed to apply the skills required to answer both sets of reading comprehension questions in short answer and multiple choice format. The explicit group had the first set of comprehension questions explicitly modelled to them and were then instructed to answer the second set independently.

Session Nine

In **session 9**, students used reading strategies to understand a different form of narrative text. The text was in the format of an e-mail, and the students were relying on the strategies of choosing an approach, understanding word choice, using text structure, and making connections when dissecting the piece. Specifically, the students were instructed to read through every paragraph, highlighting the key words that determined the implications of the passage. After having done this, the researcher asked a few questions about the e-mail to ensure that the students had developed a thorough

understanding of it. The strategies that the students had relied on were discussed, and then the students were instructed to work on their individual activities. The implicit group was given two sets of reading comprehension questions relating to the e-mail to answer independently. The explicit group had the first set of questions explicitly modelled to them and the second set of questions were answered independently.

Session Ten

In **session 10**, the students relied on their reading strategies to translate a complicated narrative text. The key strategies that the students relied on were recall and prior knowledge. The explicit group received a modelled approach from the researcher, incorporating the “before” reading strategies of knowing why you are reading the text, choosing the most appropriate approach, and recall that should be used when attempting to read this type of text. Following this, students in the explicit group were instructed to read over the text and make meaning of it. Once the students had completed the reading, they responded independently to a question that tested their use of prior knowledge for the text. The implicit group was involved in a class discussion and review of the same “before” reading strategies that were used for narrative text. Following this, the implicit group was given the opportunity to read over the text and make meaning of it. Once they had completed the reading, they responded to the question that tested their use of prior knowledge for this text. The next focus of this session was on test taking skills. The students received an information sheet to read independently. They were then instructed to answer three questions pertaining to the text that the researcher reviewed with the class. The last part of the session involved a visualization exercise in which all students listened to the researcher reading about the importance of relying on all of the strategies

and skills they had learned throughout the program. The story was set in the future and described the day in which the students would be writing the Grade 10 Literacy Test and how they should best prepare for it.

Formative Tests

Upon completion of each session, all students in both groups completed a series of comprehension questions that tested their reading comprehension and test taking skills. These activities served as a formative test and were a valuable tool for determining the extent of learning that had taken place within and between both groups of students. Each formative test was marked and recorded to indicate students' performance levels within each session throughout the program.

Summative Tests

Upon completion of the 10 sessions, students in both groups (implicit and explicit) received three summative tests that incorporated the reading strategies and test taking skills taught throughout the program. These tests provided students with the opportunity to use all the strategies and skills taught throughout the program (Appendix E). The purpose of the tests was to determine whether the students were able to transfer the skills that they had learned throughout the program and apply them to a test situation. The format of the tests was consistent with respect to the number and type of questions (i.e., direct, inferential, critical). Table 1 provides an overview of the format of the Summative Tests.

The structure of each of the summative tests was similar in nature. Initially, each test had begun with students reading a text passage. Following this, they were instructed to answer reading comprehension questions that related directly to the text they had read.

Table 1

Format of Summative Tests

Title	Direct	Inferential	Critical	Meta cognitive	Multiple choice	Short answer
Narrative	3	2	2	1	4	4
Graphic	3	2	2	1	4	4
Informational	3	2	2	1	4	4

Note. Values represent the number of each type of question found on the tests.

The questions varied in their format, being either multiple choice or short answer. Most questions had a metacognitive component to them which required students to indicate the thought processes they had used when answering the questions. This metacognitive component complemented the thought processes that were taught throughout each of the sessions and that were commonly referred as the “strategies” they were to rely on when reading and responding. In order to ensure that consistency existed amongst the tests, careful selection was made in order to ensure that an equal number of the three types of reading comprehension questions were present (refer to Table 1).

The first summative test focused on the reading comprehension of a narrative text. The students were instructed to read the narrative and answer the eight test questions provided. Of the eight test questions, three were direct, two were inferential, and two were of the critical type. Most of the questions also contained a metacognitive prompt which required a response based on the thought processes that had taken place in order to answer the question. One of the question types was metacognitive in nature, requiring a response that explained the thought processes involved in answering the question. This type of question tested students’ ability to use the required thought processes in order to answer the question. Within the test, there was an equal number of short answer and multiple choice questions. Four were short answer and four were multiple choice.

The second summative test focused on the reading comprehension of graphic text. The structure and format of this test were very similar to the narrative test. The only evident difference was that the students were required to read and interpret a graphic text in the form of a comparative bar graph. The format of the test questions was consistent with all summative tests. The nature of the third summative test was based on the

reading of an informational text. The structure and format of the test were the same as the narrative summative test.

Interrater Check of Summative Tests

To ensure the reliability of the questions being asked on each summative test, a teacher colleague was instructed to evaluate all three tests and scoring keys (see Appendix E). This individual was also an elementary school teacher who had experience working with children in the regular classroom including those with experienced learning difficulties. The teacher's input was used for making any clarifications or edits to the assessments.

Procedures

This section discusses the procedures involved with the implicit and explicit groups during the program delivery.

Implicit and Explicit Groups

The study involved two grade 8 classes consisting of 50 students. One class of students was identified as the "implicit group" and the other class of students the "explicit group." The implicit group consisted of 28 students, and the explicit group consisted of 22 students. Once this had been established, the program consisting of 10 whole-group sessions began. Throughout the study, the students in both groups were taught in the exact same manner throughout each instructional lesson. The only difference between the groups was the form of instruction that was received at the end of each session. One group received implicit instruction where the students were responsible for answering two sets of reading comprehension questions based on the instructional session.

Once the implicit group completed the first set of questions, a "take up" of the activity

occurred in the form of a class discussion where students had the opportunity to share their answers and thought processes. Following this, the students were then given their second set of questions to answer independently. For students in the explicit group, the researcher modelled a reading and the first set of reading comprehension questions. The explicit group was then responsible for independently answering the recurring set of reading comprehension questions at the end of each session. The 10 whole-group sessions took place in the students' classroom and were led by the researcher.

Formative Tests

Upon completion of each session, students in both groups (implicit and explicit) were instructed to complete a formative test which consisted of comprehension questions. The same set of instructions for each set of comprehension questions were provided to the students before they began. The students were also reminded to rely on the test taking skills they had been taught in order to complete the formative tests. The students were instructed to complete the questions independently, which took approximately 20 minutes.

Summative Tests

Once the 10 sessions of the program were completed, the students in both groups (implicit and explicit) received three summative tests which provided students with the opportunity to use all of the reading strategies and test taking skills taught throughout the program. Each test focused on one of the three different forms of text taught throughout the program (i.e., narrative, informational, graphic). The students were then instructed to complete each test independently, which took approximately 40 minutes. The researcher

then collected the tests in order to evaluate them and determine whether students performed differently as a function of the study condition.

Standardized Posttest

Following the administration of the summative tests, the students completed a delayed comprehension test which was the alternative form of the standardized CAT/3 test. The results from this test were used to determine whether students had demonstrated an improvement in their reading comprehension skills as a result of the program delivery.

Field Notes

Throughout the program, the researcher observed both groups of students and recorded field notes on any positive and negative experiences they encountered throughout the sessions. The field notes were in the form of observational recordings and were documented in the researcher's daily journal. The fieldnotes were descriptive and reflective in nature, consisting of students' responses to the program sessions and the researcher's thoughts throughout the program delivery. This information provided the researcher with a summary of the students' experiences throughout the program sessions. It also served as a reflective tool for the researcher to appreciate the vast number of experiences that had taken place throughout the study.

Dependent & Independent Measures

As the study progressed, there were various dependent measures that were used in order to determine student learning as a function of the study condition. Prior to the onset of the study, students in both groups (implicit and explicit) completed the first portion of the standardized CAT/3 test. This test was administered to determine whether the two groups were functioning at the same reading level. Once the study began,

students in both groups completed formative tests at the end of each session in order to evaluate students' ongoing learning of reading comprehension strategies and test taking skills. Upon completion of the program, the students in both groups (implicit and explicit) received three summative tests in order to determine whether they were able to transfer the skills learned from the program to a test situation. Following this, the students received a delayed comprehension test which was the alternative portion of the standardized CAT/3 test. The results from this test served as the last dependent measure indicating whether students had improved their comprehension skills as a result of the program delivery.

The study consisted of one independent measure, which was the instructional condition of the groups (implicit and explicit). One group of students received implicit instruction which involved a discussion and review of the strategies and skills taught throughout the program sessions, whereas the other group of students received explicit instruction where the researcher modelled the strategies and skills throughout the program.

Scoring

This section discusses the scoring measures for each of the dependent variables.

Formative Tests

Each student in the study was provided with an individual work folder in which they stored all of the activities they had completed over the course of the study. The results from the second activity within each session served as formative tests and were analyzed to gain insights on student progress throughout the study. By observing the

students' activities from the program sessions, the researcher had a better understanding of the level of progress that was occurring in the two groups of students.

Students' responses to the formative tests were scored using a simple marking scheme which was developed by the researcher. All multiple choice questions were marked as either correct or incorrect, each being worth 1 mark. Short answer questions received a score ranging from 2 to 5 possible marks. If a question consisted of two parts, it was worth 2 marks. For example, a question worth 2 marks from session eight was, "In what two ways does the author say The Klondike Quest is different from other history books she has read?" There were two reasons mentioned in the text, which students had to record in order to get two full marks. A response of, "It is different because it has pictures and it brings the story more to life," received 2 full marks. If one response was provided, the students received a score of 1, and if no answer was provided they would receive a score of zero. This scoring format applied for all short answer questions, ranging from a possible score of 2 to 5 marks.

Summative Tests

Upon completion of the 10 sessions, the students in both groups received three summative tests that incorporated all of the reading strategies and test taking skills taught throughout the study. Each test pertained to a specific form of text (i.e., narrative, informational, graphic) and included the three types of reading comprehension questions (i.e., direct, inferential, critical) that were focused on throughout the program. Specifically, the format of each test consisted of four multiple choice and four short answer questions.

The scoring for all multiple choice questions was either correct or incorrect, each being worth 1 mark. Short answer questions received a score ranging from 2 to 4 possible marks. Students could receive a maximum of 4 marks for a short answer question that included a metacognitive response relating to the thought processes involved in answering the question. The marking scheme was designed to be consistent across all three summative tests in that each test was worth a total of 20 marks. Students' test scores for each summative test were then recorded, in addition to a breakdown of their performance on each question type (i.e., direct, inferential, critical). This allowed for an analysis of student performance by question type in addition to the type of instructional group (implicit and explicit). Once the summative tests had been evaluated by the researcher, an interrater check was performed by another elementary school teacher to ensure that the quality of students' responses was consistent with the evaluation given by the researcher.

Canadian Achievement Test CAT/3

Once the students had written the summative tests, a delayed standardized test was administered to determine whether students had improved their reading comprehension skills as a result of the program delivered. This standardized test was the alternative portion of the CAT/3 test and was scored according to its format consisting of multiple choice questions. Each question on the test was worth 1 mark and was marked as either correct or incorrect.

Field Notes

Throughout the study, the researcher kept field notes around students' reactions and responses throughout the study along with her thoughts and feelings with respect to

the delivery of the program. The field notes were in the form of anecdotal records and were recorded in the researcher's journal throughout the course of the study. The researcher also recorded observational measures of students' thought processes throughout each of the sessions. A section was also devoted to her own experiences as a researcher and teacher in the study. These field notes provided the researcher with information on the rate of student growth and learning amongst both groups along with her own learning experiences as a researcher in the study.

The field notes were coded as being either descriptive or reflective in nature. Descriptive field notes consisted of observational recordings of students' reactions and responses in the form of quotes to the program sessions throughout the study. The reflective field notes consisted of the researcher's thoughts that related to any observations, insights, or themes that had emerged during the course of the study.

Data Analysis

This section discusses the primary and secondary analyses of the study.

Primary Analysis

The primary analysis examined the effects of the independent variable on students' reading comprehension test scores from the formative and summative tests. The data from the formative and summative tests were analyzed using a one-way ANOVA to determine whether there were any differences between the two study groups. Specifically, students' ability in answering the reading comprehension questions and recalling the reading strategies and test taking skills was examined, as was their performance on the alternative portion of the CAT/3 test. A 2 (instructional condition) by 2 (time) ANOVA was carried in order to determine whether there were any

differences in the two study conditions as a result of the program delivery. Lastly, follow up t tests were administered upon completion of the study in order to determine the extent of learning that had taken place within and between both groups as a result of the program delivery. The purpose of the t tests was to compare the difference between the two means in relation to the variation in the data.

Secondary Analysis

The secondary analysis consisted of examining students' responses to the activities that were provided within each session. These activities were stored in their work folders, and the researcher kept field notes during the instructional sessions. As part of these notes, the researcher provided an ongoing observation of the students' strategy use during each session, in addition to the researcher's own reflections of the research process.

Methodological Limitations

In this study there were a number of methodological limitations which may have restricted the findings of this study and thus need to be addressed. The first limitation of this study was the composition of the student body. The students in the study all attended the same inner-city elementary school; therefore the sample size was not representative of the population of all grade 8 students. As a result, the findings from this study were specific to the students participating in the program and could not be generalized as a finding that would be consistent amongst all grade 8 students. Traditionally, inner-city schools tend to be populated by students of lower socioeconomic status and this has been correlated to lower academic performance levels (Block et al. 2002). For this reason, the

results from this study were biased based on the sample of inner-city grade 8 students. Therefore, the results cannot be generalized to the grade 8 population as a whole.

Another limitation to this study may be the actual construction and make-up of each grade 8 class. Traditionally, when constructing classes, the goal is to match the number of males and females and balance the performance levels to ensure that there are an equal number of students within each level. In the present study, a balance did exist amongst the number of males and females in each group, however there was unequal distribution of the number of students functioning at or below grade level. The implicit group consisted of twice as many students functioning at grade level for reading, relative to the explicit group. When the classes were constructed, the teachers may have been biased in their selection of various students and their performance levels. Therefore, a tremendous amount of subjectivity may exist in relation to determining students' overall level of performance. For this reason, the implicit and explicit groups were not equal in terms of student level of performance and ability.

Another limitation to this study was the absence of a true "control" group. Due to the design of the study, a control group of students who worked on completing the activities without the benefit of strategic instruction was not possible. The presence of a control group could have determined whether any significant differences existed, not only between the explicit group and implicit group, but between each group and the control group. If significant differences were found between the control group and the implicit group, it could provide further support and reaffirm the validity of teaching reading strategies and test taking skills. This design would allow for a better understanding of

how a repertoire of strategic instruction can assist in students' reading comprehension and test taking skills.

The limitation associated with the role of me as the researcher and teacher in this study could have resulted in instructional bias. As a researcher, my goal was to show that a difference in instruction (implicit versus explicit) did affect students' overall performance on reading strategies and test taking skills. However, as a teacher my goal was to instill learning and growth in both of these areas for all students. The challenge of viewing the study from the lens of a researcher and teacher may have also resulted in various instructional biases. To prevent these biases, safeguards were incorporated in the study to ensure the validity and reliability of the program and its effects. Standardized tests were incorporated to ensure that learning was not measured only through researcher-made tests that may have been biased in their design. Also, interrater checks were established to ensure that the overall evaluation of the tests was accurate and consistent.

Another limitation to this study related to the creation of the researcher-made summative tests that were written after the program was completed. The design of these tests may have been biased since the teacher and the researcher were the same individual. For this reason, safeguards needed to be included to prevent biases that may have existed. A standardized test was included along with interrater checks to ensure that the tests and their evaluations were valid and consistent.

The presence of three summative tests that were to be completed by the students was also another limitation within this study. Each test placed a specific emphasis on one of the three forms of text taught throughout the program. Therefore, students were aware of the type of test they were completing at any one time (i.e., narrative, informational, or

graphic). Ideally, one test that incorporated all three forms of text would have prevented any awareness of the type of test that may have triggered specific strategies for students to rely on.

Also, the results from the summative tests would not indicate whether the improvement in student performance was specific to their ability to apply the appropriate reading comprehension strategies or test taking skills. As a result of this, it is not possible to determine whether the increase in performance was specific to students' improvement in reading comprehension strategies or test taking skills or a combination of both. Last, in this study, 10 group sessions were provided to teach students how to apply a repertoire of reading comprehension strategies and test taking skills to three forms of texts. With additional practice using the reading comprehension strategies and test taking skills over a longer period of time (i.e., over an entire school term), comprehension and test scores might improve greatly, as could be measured on a standardized test of reading comprehension such as the CAT/3. Further research, which examines the effects of providing students with a repertoire of reading comprehension strategies and test taking skills should continue over a longer period of time to determine the long-term results of this strategic intervention. Findings from future research can be used to support and extend the findings of this current study.

CHAPTER FOUR: RESULTS

The primary analyses consisted of reviewing the comprehension data examining students' performance on the reading comprehension tests administered prior to the onset of the study program and following its completion. Secondary analyses consisted of examining students' responses to the activities provided to both instructional groups throughout the program. These activities served as formative tests and were evaluated in order to add insights about students' learning within each instructional condition. The secondary analysis also consisted of the researcher's observations of the students' strategy use during the study period and the researcher's reflections on the research process.

Overview/Statistical Procedures

The data from the dependent measures were analyzed using a one-way ANOVA to determine whether there were any differences in students' reading comprehension performance between the two study conditions. Students' mean and standard deviation performance scores on the standardized CAT/3 tests are presented in Table 2. Table 3 presents students' mean and standard deviation performance scores across all formative tests based on instructional conditions. Table 4 displays students' mean and standard deviation performance scores on all summative tests based on question type (direct, inferential, critical, and metacognitive).

In order to use the ANOVA test, the study must incorporate two or more randomized groups with one or more independent variables. One way ANOVAs were run to compare students' performance between the two instructional groups during various times throughout the study (Creswell, 2002). This test detects significant

Table 2

Students' Mean and Standard Deviation Scores Expressed as Percentages for the Canadian Achievement Test (CAT/3) Pre-and Posttest as a Function of Instructional Condition: Implicit and Explicit Groups

Test type	Implicit group	Explicit group
CAT/3 Pretest		
<i>N</i>	28	21
<i>M</i>	66.61	52.86
<i>SD</i>	18.96	18.34
CAT/3 Posttest		
<i>N</i>	23	21
<i>M</i>	66.26	63.57
<i>SD</i>	13.87	12.27

Table 3

Students' Mean and Standard Deviation Scores Expressed as Percentages from Sessions two to ten as a Function of Instructional Condition: Implicit and Explicit Groups

Session number	Implicit group	Explicit group	<i>p</i> value
Session 2			
<i>N</i>	24	21	0.975
<i>M</i>	30.00	29.86	
<i>SD</i>	16.67	12.99	
Session 3			
<i>N</i>	25	20	0.245
<i>M</i>	45.72	53.60	
<i>SD</i>	20.01	24.87	
Session 4			
<i>N</i>	24	21	0.250
<i>M</i>	61.75	54.67	
<i>SD</i>	19.99	20.70	
Session 5			
<i>N</i>	23	19	0.543
<i>M</i>	42.52	37.95	
<i>SD</i>	24.33	23.72	
Session 6			
<i>N</i>	27	21	0.024
<i>M</i>	47.04	58.29	
<i>SD</i>	14.95	18.44	
Session 7			
<i>N</i>	22	19	0.128
<i>M</i>	45.14	34.37	
<i>SD</i>	27.20	13.96	
Session 8			
<i>N</i>	21	20	0.877
<i>M</i>	44.38	45.50	
<i>SD</i>	24.12	21.78	
Session 9			
<i>N</i>	23	18	0.942
<i>M</i>	63.26	62.78	
<i>SD</i>	20.65	21.02	
Session 10			
<i>N</i>	23	20	0.843
<i>M</i>	50.74	52.45	
<i>SD</i>	32.00	22.59	

Table 4

Students' Mean and Standard Deviation Performance Scores Expressed as Percentages on the Three Summative Tests as a function of Instructional Condition: Implicit and Explicit Groups

Question type	Implicit group	Explicit group	<i>p</i> value
Narrative Text			
Direct			
<i>N</i>	23	22	0.217
<i>M</i>	84.00	74.36	
<i>SD</i>	28.32	22.87	
Inferential			
<i>N</i>	23	22	0.875
<i>M</i>	42.39	40.91	
<i>SD</i>	29.61	33.22	
Critical			
<i>N</i>	23	22	0.787
<i>M</i>	59.26	56.86	
<i>SD</i>	30.22	28.77	
Metacognitive			
<i>N</i>	23	22	0.916
<i>M</i>	85.48	86.32	
<i>SD</i>	26.36	26.67	
Narrative Total Score			
<i>N</i>	23	22	0.182
<i>M</i>	65.04	57.68	
<i>SD</i>	19.80	16.36	

(table continues)

Note. Summative Test One on Narrative Text "The Day Niagara Falls Ran Dry,"

Summative Test Two on Graphic Text "The Number of Left-Handed and Right-Handed

Students in Grade 8," and Summative Test 3 on Informational Text "The Earthride."

Question type	Implicit group	Explicit group	<i>p</i> value
Graphic Text			
Direct			
<i>N</i>	25	22	0.007
<i>M</i>	65.20	85.91	
<i>SD</i>	30.16	17.09	
Inferential			
<i>N</i>	25	22	0.010
<i>M</i>	94.00	70.45	
<i>SD</i>	16.58	39.82	
Critical			
<i>N</i>	25	22	0.668
<i>M</i>	57.00	60.82	
<i>SD</i>	29.33	31.37	
Metacognitive			
<i>N</i>	25	22	0.058
<i>M</i>	39.28	21.14	
<i>SD</i>	34.70	28.26	
Graphic Total Score			
<i>N</i>	25	22	0.678
<i>M</i>	62.20	60.27	
<i>SD</i>	16.00	15.49	

(table continues)

Question type	Implicit group	Explicit group	<i>p</i> value
Informational Text			
Direct			
<i>N</i>	27	20	0.158
<i>M</i>	57.00	43.35	
<i>SD</i>	32.74	31.35	
Inferential			
<i>N</i>	27	20	0.419
<i>M</i>	47.93	54.90	
<i>SD</i>	27.57	30.77	
Critical			
<i>N</i>	27	20	0.330
<i>M</i>	60.48	53.30	
<i>SD</i>	26.39	22.25	
Metacognitive			
<i>N</i>	27	20	0.167
<i>M</i>	43.19	57.45	
<i>SD</i>	33.50	35.66	
Informational Total Score			
<i>N</i>	27	20	0.728
<i>M</i>	46.48	48.05	
<i>SD</i>	14.09	16.88	

differences between the means of the treatment groups as a whole and has the ability to test each factor while controlling for all others. It also detects interaction effects between variables and therefore is a powerful statistical test (Creswell). Follow up *t* tests were administered upon completion of the study in order to determine the extent of learning that had taken place within and between both groups as a result of the program delivery. The purpose of the *t* tests was to compare the difference between the two means in relation to the variation in the data (Creswell). Last, a 2 (instructional condition) by 2 (time) split plot ANOVA with repeated measurement in the last measure was carried out in order to determine whether there were any differences in students' standardized reading comprehension scores across the two study conditions as a result of the program delivery.

The scoring protocol used for the summative tests prior to the onset of the study and upon its completion were based on providing students with 1 mark for each correct multiple choice answer. The grading scheme used for the formative tests throughout the program and the summative tests that followed directly upon its completion varied depending on the question type. All multiple choice questions were marked as either correct or incorrect. Short answer questions received a score ranging from 2 to 5 possible marks. If a question consisted of 2 parts, it was worth 2 marks. For example, a question worth 2 marks from Session 2 was, "What did Dr. Witelson and her team do with Einstein's brain?" For the first mark they had to identify the question type as being "direct" and then provide the answer, "Dr. Witelson and her team compared Einstein's brain tissues with those from males close to his age." A question worth 3 marks would

require three pieces of information. For example, this question worth three marks came from the first summative test.

“The first paragraph states that “It was the only time in recorded history that this wonder of the world had been stilled.” Yet, the last paragraph states, “On six other occasions, it had frozen over completely.” Provide an explanation that would clarify this inconsistency.

For the first mark they had to identify the question type, which was “inferential.” The second mark was given for naming the strategy used to find the answer, which was looking back in the text and searching for clues, and the third mark was given for answering the question, “They are stating that it was the only time that Niagara Falls had stopped, but the American Falls had stopped on six other occasions when it had frozen over.” Full marks were given for a response that was explained fully and a half mark was given if a partial explanation was provided. Questions that were worth 3 or more marks required three or more responses.

Canadian Achievement Test

The results from the Canadian Achievement Test administered prior to the onset of the study showed a significant effect for instructional condition, $F(1, 48) = 12.14$, $p < .05$. Students in the implicit group attained significantly higher comprehension scores on the pretest in comparison to students in the explicit group, $t = 3.48$, $p < .05$. Upon completion of the study, the results from the Canadian Achievement Test indicated no significant difference in performance between the two study conditions, largest $F(1, 42) = 0.461$, $p > .05$.

Program Sessions and Formative Tests

The results from the program sessions indicate no significant differences in reading comprehension performance scores between students in the two study conditions, largest $F(1, 43) = 0.01, p > .05$ with the exception of the sixth session involving the reading and interpreting of graphic text, $F(1, 46) = 5.45, p < .05$. Students in the explicit group performed significantly better when reading and interpreting graphic text than those in the implicit group, $t = 2.33, p < .05$. In summary, the explicit group produced means that either closely met or exceeded those of the implicit group in six of the nine study sessions, with the sixth session showing results that met the criteria for significance. The data clearly show that the explicit group, whose performance on the pretest was significantly lower than the implicit group, showed an increasing trend in overall reading comprehension and test taking performance throughout the study sessions. This increased performance is evident as the mean values were closer together and at times exceeded the implicit group, with one session showing statistical significance.

Summative Tests

The results on all three summative tests showed no significant differences between the two study conditions for overall reading comprehension performance, largest $F(1, 46) = 0.074, p > .05$. There were, however, significant effects for question type on the graphic summative test. Specifically, students in the explicit group performed significantly better on direct questions, $F(1, 46) = 8.08, p < .05, t = 2.84, p < .05$, whereas students in the implicit group performed significantly better on inferential questions, $F(1, 46) = 7.318, p < .05, t = 2.71, p < .05$. Again, the performance scores

indicated a similar trend between groups as seen throughout the program sessions. The first summative test results indicate that the implicit group performed slightly better than the explicit group; however, the results showed no signs of statistical significance. The results from the second summative test showed a trend in which the explicit group performed similarly to the implicit group. On the final summative test the explicit group descriptively outperformed the implicit instructional group; however, the results did not reach significance.

Descriptive Trends and Observations: Summative Tests

This trend evident in the summative tests illustrates a greater improvement in the explicit group, as these students nearly met the performance of their peers in the implicit group and descriptively outperformed them in the final summative test. With continued instructional training, the explicit group may have significantly outperformed their peers in the implicit group.

Researcher Observations

As the researcher was also the classroom teacher throughout the course of the study, there was a rich opportunity for the researcher to make observational fieldnotes. Throughout the study sessions, various themes emerged with respect to the students' levels of motivation, personal reactions, and overall knowledge of the strategic instruction provided throughout the program. In this study, fieldnotes took the form of observational recordings during classroom discussions and interactions with students in both instructional conditions. The purpose of the fieldnotes was to record information as it occurred in the setting and to allow the students to share their views and opinions about the content provided throughout the program (Creswell, 2002). The recorded fieldnotes

were descriptive and reflective in nature, consisting of students' reactions and responses to the program sessions as well as the researcher's thoughts and experiences during these sessions (Creswell).

The researcher noted that students in both the implicit and explicit instructional conditions were eager to participate in the study sessions involving reading comprehension strategies and test taking skills. There appeared to be no differences in the amount of effort or enthusiasm being put forth by the students across the study conditions.

Once the study was introduced and the students were given their first activity, it was evident that they were interested in the study strategies and how they would apply them to their own reading and test taking. Students expressed their motivation to participate in the study by asking, "What is our next session going to focus on?" and "When are we going to learn the strategies that will help us become better at writing multiple choice tests?"

Within each study condition, there was a range of student abilities (as was evident from students' written work on the formative and summative comprehension tests), including those with identified learning exceptionalities. However, with the exception of a few students who had identified language difficulties, all were capable of completing the program sessions and the comprehension tests that followed independently.

Throughout the program sessions, students shared their personal reactions to the program sessions and the activities that followed. During the initial sessions, many students commented about their "lack of awareness" of the possible reading strategies

that should be used when reading various types of text. Across both instructional conditions some students commented, “I never knew that there were strategies that you could use before, during, and even after reading a story,” while others stated more specifically, “I never knew that there were so many different types of reading strategies that could be relied on during reading.” Students in both instructional conditions found the reading strategies chart that outlined all of the “before,” “during,” and “after” reading strategies very useful and a practical resource. For many students, it seemed as if this was their first introduction to these strategies.

As the sessions progressed and the instructional focus moved to test taking skills, the students showed an interest in learning the three different types of reading comprehension questions and looked forward to identifying question types. Again, students in both instructional conditions expressed their unfamiliarity with study concepts. Many of the students expressed the fact that they “never knew that questions could be identified as one of three types”. One student commented that being able to distinguish the question type was “a very useful strategy that helped us determine where to find the answer and how it should be answered”. The majority of students in both conditions commented that they had never been instructed about how to respond strategically to multiple choice questions: “In all of our elementary school years, we have never been taught how to work our way to the correct answer when given a multiple choice question.” One student in the explicit group stated, “I really enjoy coming across a direct type question because then I know that the answer is found directly in the text.” Other students shared their interests in answering test questions: “It helps me when I highlight the key words in the question.” Last, students in both instructional conditions

showed great interest in how to analyze and interpret graphic text. Students commented, “I enjoy reading the headings to determine what information is provided on a chart,” and “identifying the different types of information shown on bar graphs is really interesting.”

Students appeared eager to apply the multiple choice question answering strategies taught to them. When the instructor informed them that their final summative test would be in the form of multiple choice, one student responded, “I feel much more confident in answering multiple choice questions.” Another student stated, “Now that we are aware of the strategies involved in answering multiple choice questions, we prefer this type of a test over one that is based on short answers.”

Researcher Reflections

There were many challenges that the researcher faced throughout the course of the study, including being the students’ classroom teacher. The researcher had to be very cautious about how she provided instructions that pertained to the activities in both groups. Therefore, the researcher had to follow strict guidelines pertaining to the form and sequence of instruction that was delivered to each group of students. “After today’s session, I realize how much of a challenge it is to ensure that the instructions I provide to both groups are consistent and follow the format for each instructional condition” (Session 1, January 10, 2005).

The program sessions and formative tests contained in this program appeared to be challenging for the majority of students. While the provided reading passages were pilot tested to be at an appropriate interest and reading level for grade 8 students, the program test questions appeared to be beyond some students’ capabilities. Reading the questions aloud was credited with making it possible for students to comprehend the

formative tests provided in the 10 sessions. “After having marked the first set of formative tests, it is clear that most students in both instructional groups struggled with the reading comprehension questions relating to the story of Albert Einstein” (Session 2, January 12, 2005).

Based on the quality of responses on the formative and summative tests, it was clearly evident that students in both instructional groups preferred “direct” questions over the more complex “critical” ones. This was witnessed through the quality and evaluation of their responses to both types of questions. In the ninth session, students were required to read an e-mail entitled “Greg’s E-mail.” While responses to the direct questions were very accurate, those provided for the critical questions were often incomplete. An example of a direct question stated, “Where does Greg work?” and a typical response was, “Greg works at a store called Cool Threads.” This answer would be given a full mark. However, the critical question stated, “What does Greg want to get your opinion about on Friday night? What would you say? Why?” A typical response was “I would say that he should speak up about the person stealing.” This answer was given 1 out of 3 possible marks because only one of the three parts to the question was answered. As a result, the quality of students’ responses to critical questions seemed to decrease. In other words, students provided an answer pertaining to only one portion of the question. “The students seem to really be grasping the ability to answer direct questions without any assistance; however, critical questions overwhelm them, and many students do not even attempt to provide a complete answer” (Session 9, February 7, 2005).

Through class discussions, it became evident that students in both instructional conditions had minimal prior experiences with critical questions. Responses that required

students to express their opinion or thoughts were most challenging, with students who possessed minimal prior knowledge struggling the most and requiring continuous assistance and feedback. “After discussing the purpose of critical questions to both groups of students, I realized that their inability to correctly respond to the question was correlated to the extent of prior knowledge they had on the topic. Those students who were able to connect with the text through their prior knowledge seemed to provide more complete answers than those who had no connection with the content in the text” (Session 5, January 25, 2005).

As the study progressed, students who received modelling (explicit condition) appeared to have a clearer understanding of the activity expectations and demonstrated greater confidence while completing their tasks than did students in the implicit condition. Furthermore, they tended to demonstrate minimal reliance on the instructor for clarification. For example, a few students in the explicit group stated, “No teacher has ever modelled how to actually read a passage that incorporates various reading strategies” and “changing your tone of voice to distinguish when you are relying on the reading strategies to understand the written text helped us understand how we can do that when reading a story to ourselves.” Last, “we have never been taught the strategies that are effective in narrowing down options when answering multiple choice questions.” On the other hand, students in the implicit group received only a discussion and review of these strategies. They did not appear to fully understand the activity and appeared to lack confidence while completing their activities, directing more questions to the researcher. One student continuously questioned, “What is it that you want us to record as the final answer here?” Another student commented, “I don’t understand what we are expected to

do with these questions.” These statements alone verified that prior to this study, little class time was spent on explicitly teaching reading comprehension strategies and test taking skills and verified the importance of modelling through explicit instruction. “During today’s session, the students in the explicit group were very clear on the expectations for the formative test and no questions were asked, whereas the implicit group seemed to struggle with the activity. It seems that the explicit instruction is really helping students understand the purpose of the activity and its expectations. I really noticed a big difference in the confidence level between both groups today. The implicit group looked confused while completing the activity, whereas the explicit group seemed confident and focused throughout the work session” (Session 6, January 27, 2005).

In conclusion, it appeared that students in both instructional conditions did not have much prior knowledge about the various reading strategies and test taking skills that were taught to them throughout the program. For instance, many of the students did not recall hearing terminology used throughout the program such as, “before reading,” “during reading,” and “after reading” strategies.” Many of the students in both instructional conditions were intrigued by the new terminology that they were now able to use independently when reading texts and responding to comprehension questions. For example, one student commented, “In the past I never paid any attention to the way words were put on a page. Now I realize that bolded words or those in italics are in that format for a reason and that is to emphasize an important concept within the text.” “After our discussion on the effectiveness of the study, it was very clear that students in both conditions benefited from the program sessions. They were thrilled with the reading strategies and test taking skills they had learned and seemed to enjoy sharing the new

vocabulary that they had acquired throughout the course of the study” (Session 10, February 9, 2005).

Summary

Prior to the onset of the study, students’ performance scores on the reading comprehension pretest showed significant differences between the two instructional conditions. Students in the implicit group performed significantly better on the reading comprehension measure than did students in the explicit group. The findings from the study indicate that there were no significant differences between students’ performance scores during the program sessions as a function of instructional group, with the exception of a significant difference in the reading and interpreting of graphic text. Students in the explicit condition outperformed students in the implicit condition on the formative test that addressed graphic text structure. Upon completion of the program, there were no significant differences across students’ comprehension and test taking skills as a function of instructional condition.

There were, however, significant differences across question type on the graphic summative test. Specifically, students in the explicit group performed significantly better on direct questions relative to students in the implicit group. For inferential questions, students in the implicit group performed significantly better than those in the explicit group.

The results from the final standardized CAT/3 comprehension posttest indicated no significant differences across students’ comprehension and test taking skills as a function of instructional condition. When comparing the implicit group’s performance prior to the onset of the program and after a delayed period following its completion, the

group means were very similar. However, the explicit group's performance prior to the study and after a delayed period of time showed a significant increase, having nearly met the scores of those in the implicit group. Collectively these results confirm the benefits of providing students with explicit instruction in reading comprehension and test taking skills.

CHAPTER FIVE: IMPLICATIONS OF THE FINDINGS AND DIRECTIONS FOR FUTURE RESEARCH

This chapter provides an overview of the implications of the findings in the current study. Specific information about the implications for theory and classroom practice are presented here. This chapter concludes with a brief description about suggestions for future research.

Summary of the Findings

The purpose of this study was to examine whether providing students with explicit instruction enhanced their reading comprehension and test taking skills for narrative, graphic, and informational text, relative to providing them with implicit instruction. Over a 10-session program, students in the implicit group discussed and reviewed the “before,” “during,” and “after” reading strategies along with the test taking skills required to respond to questions relating to the various forms of text. Following this instruction, the students were required to complete two reading comprehension activities based on the program session independently. The first activity was then reviewed in order to ensure that students understood its expectations. Explicit instruction involved a more extensive form of instruction which incorporated modelling and guided feedback from the researcher. The first activity was modelled as a “think aloud” by the researcher, with students completing the second activity independently. In both conditions, students completed the same activities.

Students’ comprehension and test taking skills were measured by students’ performances on the direct, inferential, and critical multiple choice and short answer questions that were presented immediately following each program session and upon the completion of the program. Immediately following the completion of the study, both

instructional conditions received three summative tests to determine whether the reading comprehension and test taking skills presented throughout the program were transferable to a test situation. Finally, students in both instructional groups completed a standardized reading comprehension test approximately 3 months after the completion of the study. This delayed reading comprehension test was administered to determine the long term learning that had occurred within and between both groups as a result of the instructional condition and program delivery.

Overall, the findings from this study indicate that students in the explicit group showed a trend towards improvements in reading comprehension strategies and test taking skills relative to students in the implicit group. This finding was evident when comparing the implicit and explicit groups' standardized CAT/3 test performance scores prior to the onset of the study and upon its completion. Scores from the reading comprehension test administered prior to the onset of the study indicated a significant difference in overall performance between the implicit and explicit groups, with students in the implicit group significantly outperforming their peers in the explicit group. However, results from the delayed comprehension test administered 3 months after the program was completed showed no significant differences in performance between the instructional groups. When comparing the reading comprehension results within each instructional condition prior to the study and upon its completion, the implicit group's performance remained relatively constant; however, the explicit group showed an increased performance on the posttest. Since the implicit and explicit groups were not equal in their reading comprehension skills prior to the onset of the study, the increase in the explicit group's poststudy performance scores suggests that these students benefited

from explicit instruction. While it is difficult to determine the exact performance gains that were a result in instruction to reading comprehension versus test taking strategies respectfully, the results of this study suggested that providing students with explicit instruction in this combined repertoire was a positive learning experience.

Comprehension Tests

Prior to the onset of the study, a standardized comprehension test was administered to students in both the implicit and explicit study conditions. This test was administered to determine whether the two instructional conditions were functioning at the same level with respect to their reading comprehension. The findings indicated that students in the implicit condition significantly outperformed their peers in the explicit condition. This difference in group performance can be attributed to the dynamics of the class. Variations in the number of males and females, along with the number of students functioning at or below grade level, can cause significant differences on overall group performance. In the present study, the implicit group consisted of 18 females and 10 males, whereas the explicit group consisted of 15 females and only 7 males. The groups also differed with respect to their performance levels according to their reading grade on the first term report. Of the 28 students in the implicit group, 13 were performing at the grade-eight level, in comparison to only 5 of the 22 students in the explicit group. Ideally, balanced classes would consist of an equal number of students functioning at various performance levels. However, in this study the implicit group consisted of twice as many students performing at the grade 8 reading level. This unequal distribution of students functioning at or below grade level, created an unequal distribution of the grade 8 students in both classes. As a result, the implicit and explicit groups were not

functioning at the same level and therefore displayed significant differences in their reading comprehension performance prior to the onset of the study.

Formative Tests

The findings from this study demonstrated no significant differences in students' reading comprehension performance between the implicit and explicit study groups during the program sessions. There was, however, one exception during the sixth session on reading and interpreting graphic text. Students in the explicit group significantly outperformed their peers in the implicit group. This finding suggested that the modelling and guided feedback provided in the explicit condition enabled students to perform better when reading and responding to graphic text. Another reason for this finding may be attributed to the nature of this form of text. The provincial curriculum seems to place the least amount of emphasis on graphic forms of text, therefore students are very unfamiliar with its format and as a result have not had the opportunity to acquire the necessary strategies or skills to comprehend this text. Once students had been provided with the modelling and guided feedback for reading and interpreting graphic text, which initially was unfamiliar to them, students in the explicit condition seemed to show significant increases in reading performance relative to students in the implicit condition. Therefore, there seems to be a significant benefit in providing students with explicit instruction when they are encountered with a form of text that is uncommon to them. This finding is consistent with the results from previous studies where explicit learning gains are greatest for students with learning difficulties or when confronted with challenging materials (Block, Gambrell, & Pressley, 2002; Brown, Pressley, Van Meter, & Schuder, 1996).

Since no significant differences were found across instructional conditions for the other sessions, it is likely that students needed more explicit practice sessions on narrative and informational texts, which they were more familiar with before assuming independent ownership of the strategy. This familiarity with both forms of text may have decreased students' interest level in developing the necessary reading comprehension strategies, and thus caused them to revert back to their own means of understanding narrative and informational text. Studies have shown that, especially for poor readers, multiple guided practice sessions with explicit feedback and cues that are gradually faded over time are necessary for student success (e.g., Gardill & Jitendra, 1999). Since the program consisted of only 10 sessions, the explicit group may have shown greater improvements in their reading comprehension if the program had continued for a longer period of time (Gardill & Jitendra).

Summative Tests

The results on all three summative tests showed no significant differences between the two study groups for overall reading comprehension and test taking skills. There were, however, significant effects for question type on the graphic summative test. Specifically, students in the explicit group performed significantly better on direct questions relative to students in the implicit group. Coincidentally, most of the questions provided in the sixth session were of the direct type. Therefore, students had more exposure to direct type questions during this program session, with this familiarity likely contributing to an increase in performance by the explicit group when confronted with this question type. However, these findings were not consistent with all question types. For inferential questions, students in the implicit group performed significantly better

than those in the explicit group. This finding may have reflected their enhanced reading abilities prior to the onset of the study. Research has shown that direct questions require the least amount of higher order processing when compared to inferential and critical questions (Bloom, 1956). Since the implicit group consisted of twice as many students performing at grade level in reading relative to those in the explicit group, the implicit group may have had more of a natural ability to respond to inferential questions resulting in an enhanced performance. Given more training, the explicit group may have been able to develop the skills required to improve their ability to respond to inferential type questions.

Upon completion of the study, the results from the Canadian Achievement Test indicated no significant differences in students' reading comprehension scores across the implicit and explicit study conditions. The significant differences in reading comprehension scores that were evident prior to the onset of the study were no longer apparent upon completion of the program. This finding clearly revealed the importance of providing students with modelling and guided feedback during explicit instruction. In this present study, students in the explicit condition showed gains when "think aloud" modelling was provided to them by the researcher. This form of modelling required students to listen while the researcher read the text and incorporated relevant reading strategies. Research has demonstrated that, in general, reading and modelling the thought process required to comprehend text enables students to apply the same thoughts to their own independent reading. When students listen to text being read and strategically processed, their working memories are not burdened with the decoding process, with this being especially relevant for struggling readers (Nation, Adams, Bowyer-Crane, &

Snowling, 1999; van den Broek & Kremer, 2000). Modelling enables students to focus on the process of “how” to incorporate strategies when reading and answering questions about text. Furthermore, research has demonstrated that when students have a deep understanding about how and when to use strategies, their performance is improved (Gaskins, 1988; Jitendra, Hoppes, & Xin, 2000).

Implications for Theory

A substantial body of research exists on the teaching of specific strategies to improve students’ reading comprehension (e.g., Boyle & Weishaar, 1997; Coffman, 1997; Denner & McGinley, 1992; Gardill & Jitendra, 1999). However, little research exists which examines teaching students a repertoire of strategies to facilitate reading, despite the findings that good readers possess a repertoire of strategies which they are able to apply flexibly across different learning situations (Pressley & Woloshyn, 1995). Some programs such as Reading Recovery do teach students a variety of strategies to increase their reading performance but do so over an extended period of time. It is unusual to find many multiple-strategy studies that provide students with a repertoire of strategies over a short period of time, as is the case in the current study (e.g., Jitendra et al, 2000). Furthermore, relatively few researchers have examined the effects of teaching students a repertoire of reading strategies in combination with appropriate study skills.

This study is unique in that it examined teaching students a repertoire of strategies to improve reading comprehension, as well as, provided them with instruction in test taking. The study skills that were emphasized in this study related to effectively responding to three forms of short answer and multiple choice questions (i.e., direct, inferential, critical). Addressing both reading comprehension strategies and test taking

skills, provided students with the opportunity to develop an effective repertoire of strategies and skills that are not only required for reading texts but also for responding to corresponding questions.

Implications for Classroom Practice

The use of explicit strategy instruction in the classroom provides students with a deeper understanding of the strategies taught and helps develop their own internal schema of how to effectively use reading comprehension strategies and test taking skills (Rowe & Rowe, 2002). Incorporating “think aloud” modelling and guided feedback throughout the school year allows students to develop confidence in using the “before,” “during,” and “after” reading strategies and test taking skills, as well as, recognize the advantages associated with their use. This may be particularly beneficial for poor readers (including those who have learning disabilities; Gardill & Jitendra, 1999). Gardill and Jitendra found that students with learning disabilities required an average of 20 to 23 sessions with a reading comprehension strategy before they were able to internalize the procedure. Gardill and Jitendra noted that students with learning disabilities may need even more modelling, guided feedback, and practice than their peers without disabilities in order to benefit from strategy instruction. Gardill and Jitendra emphasize the importance of additional strategic instruction to assist weaker students who may have memory deficits and need additional reminders about how to use a reading comprehension or test taking strategy effectively (i.e., metacognitive prompts). Teachers need to be especially vigilant in getting students to attribute their reading success to the use of the “before,” “during,” and “after” reading strategies and effective test taking skills. Ideally, classroom teachers should be aware of the benefits that arise from providing students with effective “think

aloud” modelling and guided feedback on reading strategies and test taking skills over an extended period of time. There are many benefits in providing students with this form of instruction during the course of a year. With continuous repetition and modelling of the reading strategies and test taking skills, students can eventually incorporate the required thought processes independently, in hopes that the strategies will eventually become automatic to their processing of various forms of text. As research has indicated the effectiveness of providing this form of instruction to a large group of students, educators should not hesitate to incorporate this form of instruction with an entire class that may be performing at various reading levels. The findings of this study also provide evidence that explicit strategy instruction can be taught to large groups of students. Much of the previous research on strategic instruction appears to only focus on small-group or individual instruction (e.g., Jitendra et al., 2000). As evident in the present study, the concept of forming small group instruction is not necessary in order to improve student reading comprehension and test taking skills. Strategic instruction was provided to a whole class of students and the improvement in reading comprehension and test taking skills evident in the explicit group further supports the benefits of this form of instruction to a large group of students.

Research has shown that it is important not only to teach students “how” to use effective strategies, but also to provide them with the “will” or “motivation” to use them (Gaskins, 1988). Gaskins found that “motivation to use strategies was specific to students’ beliefs about the relationship of effort to success for a particular task” (p. 541). This is consistent with the principles of explicit instruction and passing control of the strategy from the teacher to the student (Pressley et al., 1989). When students believe

that the strategy can increase their performance, they are more willing to learn how to use it effectively (e.g., Dole, Brown, & Trathen, 1996; Gaskins; Pressley et al.). The current study supports this finding. Throughout the program sessions, the researcher observed that students in both instructional conditions were generally very positive about using the presented strategies. The majority of students commented that they found the reading comprehension strategies and test taking skills beneficial when reading and responding to text. Many students in the explicit condition added that they “would use the strategies whenever they were given any form of text in any subject area in the future.”

At this point in the program, however, their level of mastery was questionable. Teachers who are instructing their students on the use of specific strategies need to remember that focused time needs to be spent teaching students how to use the strategy. The control of the strategy needs to be gradually shifted from the teacher to the students so that the students can be in control of the strategy use and can witness that strategy use can increase their performance (Dole et al., 1996). Therefore, a key component to effective strategy instruction is to provide students with the necessary time and opportunities for practice required to develop the confidence and apply the strategies independently and effectively to any form of text. Educators need to provide ongoing guided practice and feedback until it is apparent that students are able to apply the strategies and skills to their own reading. When this level of proficiency is evident, educators can turn over the responsibility for strategy use to the students. This shift from dependence on the teacher to self-sufficient student use is dependent on how well the strategy has been modelled, opportunities for practice and the comfort level of the students. Educators must be very conscientious to ensure that the students have

developed the skills and confidence necessary to use reading and test taking strategies effectively.

The program sessions provided numerous examples of the various strategies that can be incorporated when reading different forms of text. Upon completion of the first program session, students admitted that they had not used the various “before,” “during,” and “after” reading strategies in the past. Instead, many of the students were able to describe only typical classroom procedures of “reading stories and answering questions.” These class discussions suggested that little strategy use was being employed in the classroom in spite of the overwhelming base which supports its use in educational environments (Dole et al., 1996). Alternatively, it may be possible that when strategy use was taught it was not being identified as such to students, and therefore they could not articulate its usage. Once again, this emphasizes the importance of explicit teaching of reading strategies and test taking skills to students. Students need to know the benefits of learning these strategies and need to be provided with cues and prompts in order that they will be able to generalize their use over time. Gaskins (1988) and Pressley et al. (1989) emphasize that students need to know when and where strategies should be used, in order to have them use the strategies independently and effectively.

In order for students to receive explicit strategy instruction, teachers must first be aware of the need to provide explicit instruction in the classroom. Pressley et al. (1991) interviewed 31 classroom teachers at Benchmark school. Benchmark is a school dedicated to research-based teaching for its students who are delayed readers between the ages of 6 and 14. Ninety percent of these teachers believed that postsecondary education had not taught them to become a strategic teacher.

Information about explicit instruction needs to occur at the preservice level so that beginning teachers can enter the classroom prepared to provide their students with a repertoire of learning strategies. The theory behind teaching explicit instruction should be incorporated into the preservice content courses in order to make teachers aware of its purpose and effectiveness in educating students across all subject areas. Following the theoretical component, preservice instructors should be required to model this form of instruction in order for teacher candidates to appreciate how the theory of explicit instruction can be effectively transferred into practice. Second, this form of instruction should then be incorporated as part of the evaluation during each preservice teaching block to further emphasize the importance of explicit instruction in the classroom. In addition, it is important to provide quality in-service training to teachers who are already in the classroom. Teachers also need to be supported in their attempts to provide such instruction, and school boards should provide the resources required to incorporate explicit teaching into the classroom effectively. New teachers and experienced teachers alike need to be made aware that explicit strategy instruction can be easily implemented into the classroom and that the benefits of doing so are well documented in the research. Mathes, Fuchs, and Fuchs (1997) believe that as classrooms become more heterogeneous, teachers will need to possess knowledge about effective strategies that will benefit all students.

Explicit strategy instruction was taught to a group of intermediate inner-city students in this study. Anecdotal observations and the researcher's fieldnotes indicated that all students were able to learn how to use the reading comprehension strategies and test taking skills. However, teachers can adapt the strategies to be applicable to the needs

of children in both the primary and junior levels. For instance, strategies like mental imagery where students are asked to create pictures in their minds while activating prior knowledge of what they already know about a topic are effective in increasing their reading comprehension. Introducing these strategies and study skills earlier in students' educational careers enables them to familiarize themselves with effective means of reading and responding to any form of text. It also provides students the opportunity for repeated practice with these strategies and skills in hopes that they will incorporate them independently as they advance in grades.

Suggestions for Future Research

Future studies should examine the use of the implicit and explicit instructional conditions compared to a true "control group". Students in the control group would be presented with the same program and comprehension measures, but unlike the experimental groups, they would not receive additional instruction after the completion of each session. Such a condition would be more representative of situations where students are left to their own devices to process text and complete associated assessment measures.

In order to determine whether the improvements in reading comprehension performance are a result of the effective use of reading comprehension strategies, test taking skills or a combination of both, three experimental groups would have to be formed. The first experimental group would receive instruction on reading comprehension strategies alone, the second would only receive instruction on test taking skills, whereas the third group would receive combined instruction on reading comprehension strategies and test taking skills. In this way, the performance of students

in each of the 3 instructional conditions could be compared to a control group, and stronger conclusions about the relative strengths of each strategy could be made.

Replication of this study is important because of the relatively small sample size. Future research could provide stronger conclusions about how students of different reading abilities perform using each form of instruction (implicit and explicit) as compared to a control group. Further replication with more students in different grades could also provide important information about strategy use and reading comprehension at different developmental levels, providing insights about the various reading comprehension strategies and test taking skills that students must rely upon across different grades and divisions.

In the current study, reading comprehension was defined in terms of students' performance on the reading section of the Canadian Achievement Tests, Third Edition (CAT/3) Reading Assessment. This test evaluated reading comprehension through students' performance on multiple choice questions. It did not consist of any questions that were in short answer format. However, in the instructional sessions students were taught how to respond to both multiple choice and short answer questions pertaining to a form of text. This instruction provided students with the test taking skills required to answer both types of questions when responding to text. However, the standardized CAT/3 tests consisted only of multiple choice questions, and therefore did not provide students with the opportunity to respond to short answer questions. As a result, those students who may have struggled with multiple choice questions were disadvantaged. Ideally, a test which incorporates an equal distribution of multiple choice and short

answer questions would have provided a more accurate measure of reading comprehension performance in this study.

Future research should also be longer in duration, including more guided practice sessions for students to become familiar with reading comprehension strategies and test taking skills before they are required to use them independently. Studies have shown that, especially for poor readers, multiple guided practice sessions with explicit teacher feedback and cues that are gradually faded over time are necessary for student success (e.g., Gardill & Jitendra, 1999).

Presently, there is minimal research that examines strategies that would enhance students' test taking skills. However, there is a vast body of literature examining the effectiveness of teaching reading comprehension strategies, yet few researchers, have taken this concept a step further and combined the strategies required to become good readers with those required to respond to questions pertaining to written text. Therefore, this current study is unique in its design and intent to study the effects of combining reading comprehension strategies and test taking skills. Future research should examine both reading comprehension strategies and test taking skills to determine whether such combined strategy instruction would benefit students when confronted with various types of testing throughout their educational careers.

Regardless of the questions that have been raised as a result of this study, the findings suggest that when students are engaged in explicit instruction involving modelling, guided practice and feedback, attributional instruction, and monitoring of students' progress, improvements in reading comprehension and test taking skills can result. Replicating this study may provide additional insights about how reading

comprehension and test taking skills should be taught to intermediate students, especially those who are struggling readers.

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Brock University Ethics Board Approval



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DATE: November 08, 2004

FROM: Linda Rose-Krasnor, Chair
Research Ethics Board (REB)

TO: Vera Woloshyn, Education
Nancy RADOJEVIC

FILE: 04-065 - RADOJEVIC

TITLE: Exploring the Use of Effective Learning Strategies
to Increase Students' Reading Comprehension & Test Taking Skills

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The Brock University Research Ethics Board has reviewed the above research proposal.

DECISION: Accepted as Clarified

This project has been approved for the period of November 08, 2004 to June 30, 2005 subject to full REB ratification at the Research Ethics Board's next scheduled meeting. The approval may be extended upon request. The study may now proceed.

Please note that the Research Ethics Board (REB) requires that you adhere to the protocol as last reviewed and approved by the REB. The Board must approve any modifications before they can be implemented. If you wish to modify your research project, please refer to www.BrockU.CA/researchservices/forms.html to complete the appropriate form REB-03 (2001) Request for Clearance of a Revision or Modification to an Ongoing Application.

Adverse or unexpected events must be reported to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants and the continuation of the protocol.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and approvals of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research protocols.

The Tri-Council Policy Statement requires that ongoing research be monitored. A Final Report is required for all projects, with the exception of undergraduate projects, upon completion of the project. Researchers with projects lasting more than one year are required to submit a Continuing Review Report annually. The Office of Research Services will contact you when this form REB-02 (2001) Continuing Review/Final Report is required.

Please quote your REB file number on all future correspondence.

Heather Becker, Office of Research Ethics
Brock University
Office of Research Services

Appendix B

Instructions upon the Administration of the CAT/3 Test

Reading/Language Part 1

Instruction 1: Here are some tips to help you when you are doing this kind of test.

- Relax: Relax and just do your best. Don't worry about how others are doing.
- Listen: Pay attention and listen to the directions. Raise your hand if you don't understand what to do.
- Think: Work carefully but don't work too long on one item. If you don't know an answer, relax and think for a moment. Then choose the answer that seems best to you.
- Enjoy: Have fun. Enjoy seeing how much you can do.

Instruction 2: Please open your booklet to Page 1.

- This is a test in reading and language. You will read stories and answer questions. We will do two samples together. Find Sample A. Read Sample A and find the correct answer, but do not make any marks on your booklet. (Pause to allow students to read sample A. Do not read the item aloud.)

Instruction 3:

- Now look at your answer sheet. At the top of the page, you will find the section labelled "Reading/Language." Find the space beside the capital letter "A". For each question, print your answer choice using a capital letter. (Pause to allow students to do Sample A.)

Instruction 4:

- You should have recorded the capital letter "D," the letter that represents the correct answer "clean their teeth". From the passage, we know that crocodiles open their mouths because they want the birds to clean their teeth.

Instruction 5:

- Now we will do Sample B together. Find Sample B. Read Sample B and find the correct answer. Now look at your answer sheet. At the top of the page, you will find the section labelled "Reading/Language." Find the space beside the capital letter "B". For each question, print your answer choice using a capital letter. (Pause to allow students to do Sample B.)

Instruction 6:

- You should have recorded the letter “G,” the letter that represents the correct answer “chosen”. The sentence should read, “Have they chosen which path to take?”

Instruction 7:

- Now you will read more stories and answer more questions. When you see the words “Go on” at the bottom of a page, go to the next page. When you come to the word “Stop”, you have finished this part of the test. You may check your work in this part of the test only. You will have 35 minutes to finish this part of the test. Do not spend too much time on any one item. Make the best choice you can and go on. Turn the page and find the introduction to the first story. You may begin.

Instruction 8:

- This is the end part of the test. Make sure that all your answers are clearly recorded and that you have erased any marks that you do not want to show. Then close your booklet.

Reading/Language Part 2**Instruction 1:**

- Please turn to Page 14 in your booklet.

Instruction 2:

- You are going to read stories and answer questions as you did before. When you see the words “Go On” at the bottom of a page, go to the next page. When you come to the word “Stop,” you have finished this part of the test. You may check your work in this part of the test only. You will have 35 minutes to finish the test. You may begin.

Instruction 3:

- This is the end of this test. Make sure that all your answers are clearly recorded and that you have erased any marks that you do not want to show. Then close your booklet.

Appendix C

Sample Items from the Reading Component of
the Canadian Achievement Test, Third Edition (CAT/3)**PART 1: COMPREHENSION**

Sample A

Read the following passage. Then do Sample A.

Crocodiles don't have toothbrushes, but they do have birds to help keep their teeth clean. The crocodiles open their jaws and let the birds come inside. The birds then pick out the pieces of food that are stuck between the crocodiles' teeth. The hungry birds must trust the crocodiles to keep their jaws open.

According to the passage, crocodiles open their mouths because they want the birds to:

- A fly away.
- B build a nest.
- C bring them food.
- D clean their teeth.

Sample B:

The image of Hansen's "tensile arms pumping" (line 26) suggests that Hansen's arms are

- F long and thin
- G tense and cold
- H weak and tired
- J tight and strong

Appendix D

Sample of Program Sessions One and Two

Session 1

Preparations before class

- Read and be prepared to model each of the strategies from the **Reading Strategies that Work** chart
- Bring a highlighter for each student to use during the class
- If your group has already written the test, bring a copy of their **OSSLT Preliminary Feedback for Students** report to hand out to each student in your class (in a folder with their name on it, if taking this approach. See "Introduction to the Module")

Photocopying: - one per student

- **Student Intake Survey** (from your Admin Folder)
- **Reading Strategies that Work**
- **Einstein's Brain**

Make overhead of:

- **Rollerblading/Reading** chart
- excerpt from **Preliminary Feedback for Students** - chart
- **The Expert is In** (or whatever piece of reading you elect to model for them)
- **Reading Strategies**
- scales - knowledge vs text

Session Overview

- review reading strategies for improving comprehension
- read and interpret a chart
- make note of personal strengths and weaknesses in responding to Informational Text
- take a personal inventory of which strategies students already know and use, and which ones they should be making an effort to know and use
- practice reading strategies while reading Informational text

Introduction to Reading Strategies

You are all here because you have some skills you are not using because you don't know how important they are. There are probably a few new things you can learn, too. These sessions are designed to help, but you must be an active participant. Just sitting there isn't enough. I'll show you how to increase your involvement and therefore your success.

By the end of the 10 sessions, you should be able to answer a confident "strongly agree" to most of the questions on the survey you just completed.

Put up the overhead of Rollerblading vs reading. Read from side to side helping them to see the analogy.

Background for you:

This discussion is necessary because a lot of students think "word calling" is reading. They see comprehension as a separate issue. Hopefully, this will help them begin to recognize that just being able to read the words is not enough; reading is about understanding and using the information. It's not just a mechanical act. They also need to recognize that being aware of the strategies that follow is not enough: they must consciously use them.

This is an important discussion to have with them. If they don't acknowledge they have a problem, they cannot deal with it.

The point for the students to get:

If you didn't do well on the reading, chances are good you've got the basics (you can read the words) - but you need to develop your skill in making the basics work for you so the message is clear. You need to learn about and start using more of the strategies confident readers use.

One difference between reading and rollerblading is that what a skilled rollerblader does is largely visible; what a skilled reader does is not. To address that issue we are going to work on making those mental processes clear by talking about our thinking during these 10 sessions.

Background Information - marking of the test

Put up the excerpt from the Preliminary Feedback for Students on the overhead. Whether or not students have written the test, they can benefit from seeing how marks are portioned out.

Discuss how the chart is organized and help them to see the significant details.

When reading any chart, you always begin with the title and headings at the top to see what is being discussed, then look down the left side to see what categories or details are being dealt with. Who is this chart written for? (Students) How did you know that? (It says so in the title) What information is it giving to the student? (Information about reading skills) How did you know that? (There are numbers - probably test scores - and the top line of the chart says "Reading Skills")

At the top of this section, you will see this chart shows reading results, and that there are 3 types (Information, Graphic and Narrative) Ask a volunteer to explain what each of those headings means. If no one can, tell them yourself, using an example they would understand for each.

Down the left side you can see that 3 kinds of reading skills are included (understanding direct..., indirect... and making connections...) Ask a volunteer to explain what each of those headings mean. If no one can, tell them yourself, using an example they would understand for each. Assure them they will get lots of practice during these sessions recognizing which type of question they are dealing with.

Once you know what information is being presented, you can start to understand the results. In any chart, results can be read by going down a column or across a row - as you wish. For example, let's decide we prefer to find out how the person scored when asked a question that involved finding directly stated information. In that case, we'd read across the row. As we do that we see scores of 16/30; 12/16; 10/14. How do you know whether those are good scores or bad? (Prior knowledge with tests should tell them it's probably bad to get less than half right.) Which kind of reading appears to be hardest for this person? (Information - got half or less of each kind of question correct) So if your results look like this, you know you really need to listen carefully and work extra hard when we are dealing with informational text (factual text)

There is specific information on the page to help you figure out what a good score is, can you see it? (The note below about total reading score. It says this person got 113 points. A pass is 126 points.) That tells us the person needs how many more points next time to squeak by? ($126 - 113 = 13$). So if this person learned enough between now and the test to add 2 more points to his/her score in every area, would that be enough for him/her to pass? (Yes) How do you know? (Because there are 9 scores. Adding 2 more points to each score means $2 \times 9 = 18$ additional points.

So you can see that it's valuable to study your personal chart of results so you can see where you need to focus your attention during these sessions to ensure you pass next time.

The best strategy is to reinforce your strong areas so you don't backslide, and work hard on your weak areas to bring them solidly above the bar.

During today's session we'll be discussing some reading strategies that will help you improve your comprehension - if you use them. Next session we will begin looking at the 3 different kinds of questions, how to recognize them, and how to use that information to help you find the answer.

You are all here because you are close enough to passing that you can learn what you need to be successful. However, it will take effort and commitment on your part: it's not enough to just arrive and sit there.

Introduction to Reading Strategies

Explain a bit about what's involved in being a skilled reader, then tell them you are going to show them what good readers do.

Skilled readers do more than just say the words that are on the page. They get involved. They compare what they are reading to what they already know, they ask questions, they predict, they do lots of things instinctively that help them to understand and use the information they are reading.

Poor readers do not. Poor readers usually start at the top of the page, read all the way to the bottom without stopping or thinking very much about what they are reading or why, then get to the bottom and say, "I don't get it" - and they don't know what to do about it.

During these 10 sessions I'm going to teach you to use the same strategies that skilled readers use. If you use them, you will do better in school and on the test.

Provide each student with a copy of the Reading Strategies handout

Tell your students to keep this chart and to pull it out during every session as a reminder of what they need to practice. Point out that the little pictures are there to act as memory triggers for the visual learners.

Modelling

The students have done a quick overview of the reading strategies skilled readers use. Now they need to see them in action. You need to read something aloud to them so you have the opportunity to show the students what some of them "look like".

I have included an overhead of a magazine article, "The Expert is in" for you to use if you wish. In case you have never done anything like this before and are not sure what it means to model the strategies, I have included a second version of the story for your use. It has 2 fonts. The bolded words are the text as it appears in the overhead of the article. Interspersed within the text you will see a lighter font which is the running dialogue I would say if I were modelling this piece. You can use this as an example to learn from, then choose your own reading selection to model with, or you can use this selection. Whichever you choose to do, the text you are reading from must appear on an overhead so they can see what's printed and what's coming from your head.

Look up from the document each time you comment, so they can clearly distinguish between the author's words and the thoughts you are adding. Take your time so it's clear what you are doing.

As you demonstrate the reading strategies for them, you are showing them how a good reader interacts with the text to make it come alive. Good readers are attentive readers; they become involved with the text as they read - like having a dialogue with the author.

Before you begin, explain what you are about to do so they don't miss the point.

There is a big difference between the way a weak reader and a skilled reader would approach reading this. A weak reader would probably skip the title, jump right in at the first line and read all the way to the end, then decide whether or not it made any sense.

A skilled reader would approach it something like this. I'm going to think out loud as I read this to you so you can be in on my thought processes - how I am using the reading strategies to engage with the author. (see example next page)

(There is a larger version of this-in section 3 for you to make an overhead of - if you choose to model the reading strategies using this selection. The next page shows you how I would model this.)

Excerpt from, *The Expert Is In*
Advice from the cutting-room floor, by Paul Rush

Workshoppers always ask questions of experts and experts always oblige...Oddly enough, sometimes people ask me questions. But they aren't really looking for advice; rather, they wonder how I manage to get through a single day in the shop without doing something - or someone - serious harm. ...Take a look at these questions and answers and judge for yourself.

Q: What is your biggest failure?

A: It's hard singling out any one failure because the list is so long. I built my first bookcase with a few nails and boards without any back bracing. The first book turned the shelving unit into a parallelogram. That was mortifying. Of course, I've also ruined many sheets of drywall. But my biggest failure occurred trying to take a tree down.

About five years ago, I was felling a large tree on a hillside near a power line. Instead of dropping, the tree sat against the chainsaw blade. It trapped the saw and threatened to fall backwards and extinguish most of the municipality's lights. I grabbed some rope (I always use rope when I cut trees), tied it to the tree and secured it to several other trees away from the power line. I attached a third rope to my come-along to pull the tree forward but I didn't allow for the rope to stretch. After using all the wire cable the tree was still standing. I finally got it down with yet another come-along. (Yes, when I'm felling trees, I always have spare come-alongs and perhaps a block and tackle. Maybe I'm not as good at tree felling as I think I am.)

When you finish modelling, ask each group to tell the class which strategies they were watching for, then share which of those strategies they heard you use. Discuss how using those strategies would improve comprehension.

If you used my script or something very similar, they will have seen you:

- establish your purpose for reading (fun and tips)
- select an approach (looks light and entertaining, so read quickly)
- recall what you know about the topic (done during reading as topics arose e.g. tree cutting)
- get involved (predicted - phone lines, commented on his actions, made personal connections,)
- made pictures (the shelves falling down; the Wile E Coyote analogy)
- new words - used context (come-along, block and tackle)

It's important that they notice that you did not use all the strategies.

Each reading situation is different. It's like rollerblading; you don't always go the same speed or use the same kind of body postures. You push harder and bend from the waist more when going faster - you adjust your choice of movements according to your situation. It's the same with reading. Know all the strategies so you can select the ones you need for each situation. We'll talk a lot about this in these sessions so you will be comfortable with them by the end.

This is how I would model this piece. (Bolded material is the text from magazine. My comments are light)

I found this article on the back page of a magazine I like. "*Canadian Home Workshop - The do-it-yourself magazine*", June 2002). It looks like it might be fun, perhaps a chance to pick up a do-it-yourself tip. I'll start with the title to see what his subject is today.

**Excerpt from, The Expert Is In
Advice from the cutting-room floor, by Paul Rush**

I like advice. Let's see what it's about:

Workshoppers always ask questions of experts and experts always oblige...Oddly enough, sometimes people ask me questions. But they aren't really looking for advice; rather, they wonder how I manage to get through a single day in the shop without doing something - or someone - serious harm. ...Take a look at these questions and answers and judge for yourself. Sounds like it might be humorous, so I'll keep reading. I'll read it over quickly because it's unlikely to be "heavy" stuff..

Q: What is your biggest failure? (yup, it's intended to be humorous. Why else would a writer set himself up like this?)

A: It's hard singling out any one failure because the list is so long. I built my first bookcase with a few nails and boards without any back bracing. (does he mean metal brackets to hold the shelf to the wall?) **The first book turned the shelving unit into a parallelogram.** (Nope, not brackets. I guess he meant there was no back to the shelf - just boards and ends. What a novel way to say it collapsed!) **That was mortifying. Of course, I've also ruined many sheets of drywall. But my biggest failure occurred trying to take a tree down.** (I know what that feels like - we had one land on the garage roof when we tried to take it down).

About five years ago, I was felling a large tree on a hillside near a power line (Oh-oh - he's going to knock out the power for his whole neighbourhood!). Instead of dropping, the tree sat against the chainsaw blade.(oops, guess not) **It trapped the saw and threatened to fall backwards and extinguish most of the municipality's lights.** (I was close) I grabbed some rope (I always use rope when I cut trees), tied it to the tree and secured it to several other trees away from the power line. I attached a third rope to my come-along (what's that?) to pull the tree forward (must be some special kind of rope or pulling thing) but I didn't allow for the rope to stretch. After using all the wire cable the tree was still standing. (I've got a beautiful image of Wile E. Coyote trying to cut down a tree! Is he going to jump up and down on it?). **I finally got it down with yet another come-along.** . (Yes, when I'm felling trees, I always have spare come-alongs and perhaps a block and tackle (heard of it - know it's something to make lifting easier). Maybe I'm not as good at tree felling as I think I am.)

Well, that was entertaining. Didn't learn any good tips, but I think I'll share it with my husband - he'd get a kick out of it

Whole Group Practice - Activity

Now that they have thought about the strategies, and have seen them in action, it's time to put them to use. Hand out a copy of Einstein's Brain to each student. Put a copy of the Reading Strategies chart on the overhead, and ask the students to have theirs out on their desk for them to refer to. Read it aloud together. As you do, involve the students in applying the reading strategies from the chart. Some students may have already read this piece. That's good. This time they can focus their energies on applying the reading strategies they are learning about.

If you want specific guidance as to what to say for each point, read the greyed areas below.

Refer to the chart, "*Skilled readers know why they are about to read something (to learn, to locate specific information, for enjoyment,...)*"

Q: Why are you reading this?

(-for a test, to prove I can read, and understand, and prove it by following instructions accurately and by answering questions.)

Q: Have you ever stopped before reading something to consider why you are reading it? If not, highlight that description on your chart in green to remind you that you need to start doing that. To understand why you need to do that, let's continue down the chart.

Refer to the chart *Skilled readers choose their approach depending on why they are reading, the amount of time available, the type of text*

With that in mind, how would you approach reading this selection? Where would you start? How fast/carefully would you read? Would you highlight or make notes? Have them describe their approach. If the ideas below don't emerge, add them to the discussion. Be sure they know it's not important that they all approach the reading the same way. What is important is that they have a deliberate approach that does not exclude any of the important pieces of information the text provides.

- *begin by reading the title because I know it will give me clues about what I'm about to read, (is it going to tell us why his brain made him brilliant?)*
- *and I'll look at the pictures to see what information I can pick up there. This will give me clues about what I'll be reading (even though there are some big words, I can tell they are the names of parts of the brain. Being able to pronounce them would be nice, but if I can't that won't stop me from understanding their point. I see that the pictures are telling me that, although his brain was no bigger than a normal one, there was a missing region and that let another part of his brain get bigger than normal. This bigger part is used for mathematical and visual reasoning. So there was something different about his brain. Did that cause him to be a genius? I'll have to read the story to find out because it doesn't say here.)*
- *Now I'll read the story from beginning to end and highlight key points as I read (because I know they are going to ask me questions and this will help me to focus my attention and to find important information more quickly when I need to).*

Q: Would you do these things before you begin to read? If not, highlight this section in green to remind you to start.

The final thing skilled readers do before beginning to read is recall what they already know about the topic.

Q: What do you already know about Einstein?

There are many things we could be reading about Einstein, but the title and the pictures at the bottom of the second page help us to focus our attention. Q: What specifically are we going to be learning about him? (Something about his brain - perhaps how it is different)

Q: Do you stop to think about what you already know about the topic before you read? If you don't highlight this section in green. This is a critical reading strategy. It is useful before and during every reading activity.

Put the picture of the scales on the overhead.

This is to show them the value of calling up their knowledge and experience with the topic they are reading about. *As the scale illustrates, the more knowledge about a subject that you bring to a reading experience, the less dependent you are on the words on the page. If you have little or no knowledge, or you do not recall it, you are completely dependent upon the words on the page. That makes it much harder to read and understand the text.*

Think how easily and from how far away you can read a road sign when you know what name you are looking for. You can recognize it from far away just by the length and the shape of the word. If you don't know the name of the street coming up, you have to be close enough to make out every letter in order to read the word. You are totally dependent on the print for the information.

Now, read the entire selection aloud to them. Pause at appropriate points to engage them in the use of the "during reading" strategies.

- anticipate and predict (start with the title)
- stop sometimes for them to recap what you've read
- ask questions. **Have them think of some.** (e.g How was his brain different? How did his compare with other smart people's? How did imagining riding on a beam of light through space help him come up with a mathematical formula?) Help them note that some questions are answered by the text and some are not. That's to be expected. The act of thinking of questions makes the reader more involved in the reading activity and this dramatically improves comprehension and retention.)
- focus attention; "picture" what's going on (his brain, the autopsy, the brain in a jar of formaldehyde, behind a cooler in the office, a brain bank,....)
- use the context to help them understand new words, when possible
- make note of key words (underline them on the overhead as you read)
- organize new information and combine it with what they already know (already knew he was smart - still don't know why he was so smart, but we know part of his brain was bigger - either due to using it so much or perhaps he was so smart because it started out bigger)

Q: Do you do all these things as you read? If there are any you do not do, highlight them in green. In the sessions that follow, you will have opportunities to practice the strategies you don't often think to use.

Rollerblading

Basics:

- have skates
- know how to put them on and lace them up
- you know it's a similar motion to walking

Making the basics work for you:

GOAL:

- to get from one place to another without looking like a dork or getting hurt

HOW?

- watch people who can already do it
- ask them for tips, then do what they suggest
- practice, practice, practice

Reading

Basics:

- have books
- know how to read the words and string them together in sentences
- you know it's similar to talking

Making the basics work for you:

GOAL:

- to understand what you're reading and do something with the information

HOW?

- learn from people who read and understand
- use the same strategies they do as they read
- practice, practice, practice

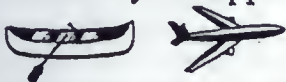



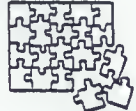



excerpt from PRELIMINARY FEEDBACK FOR STUDENTS

Reading Skills	Reading Selection Types		
	Information	Graphic	Narrative
Understands Directly Stated Ideas and Information	16/30	12/16	10/14
Understands Indirectly Stated Ideas and Information	15/40	12/22	19/28
Makes connections between personal experiences and the ideas and information in the reading selections	10/20	7/12	13/18

Your total reading score was 113 points.

Your total score was calculated by adding the total number of points for questions marked as correct (2 points) or partially correct (1 point). The score to pass reading, based on the provincial standard-setting process for the OSSLT, was 126 points or higher. (This score varies if the student wrote a special version.)

Reading Strategies that Work

Before starting to read	
Know why	Are you about to read this to learn something new? to find specific information? (e.g. the score) just for fun? to show you understand? (like on a test)
Choose your approach 	-read top to bottom, slowly and carefully? -scan quickly just to find specific details? -start with headings? captions? graphics?...
Recall 	What do you already know about the topic? Thinking about what you already know about the topic will help you understand and remember new information more easily.
During reading	
Use text layout 	BOLD <i>Italics</i> <u>Headings</u> Captions PICTURES Paragraph divisions "Punctuation!!!!?..."
Make connections 	Compare what the author says to your own experiences and opinions Connect it with other things you have read Add new information to create a new "big picture" (synthesize)
Get involved 	Predict Recap ← Ask questions Highlight key points Argue Think about who's giving you the information.
Make pictures 	MAKE A LITTLE MOVIE OF THE ACTION IN YOUR HEAD
Stuck on a new word? HUH?	Notice what's going on around it (use the context). Use grammar. Is it a thing? A description? An action? Sometimes just skipping it works.
Pay attention 	Confused? Stop. Go back and reread.....what did you miss? OR Think and read on - maybe the author is keeping you guessing.
After reading	
Review 	What was new? What was important? How could you use this? Did it change your opinion?

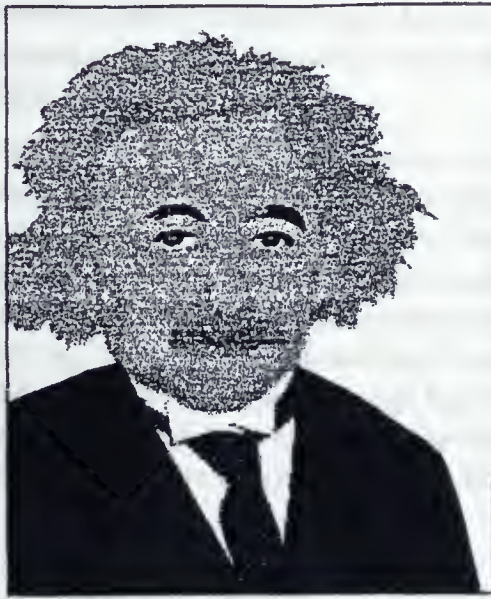


The more you know about the topic, the easier it is to read



The less you know, the harder it is to read and understand

Einstein's Brain: Built for Brilliance



Albert Einstein's brain was very different from yours and mine. What was inside his shaggy head managed to revolutionize our concepts of time, space and motion. There had to be something remarkable about Einstein's brain, but the doctor who examined the brain after Einstein's death reported that it was, to all appearances, normal – no bigger or heavier than anyone else's.

However, Canadian scientists analyzed Einstein's brain in 1999 and revealed that it had some distinctive physical characteristics after all. A portion of the brain that

governs mathematical ability and spatial reasoning was significantly larger than average. Its cells may have been more closely connected, which could have allowed them to work together more effectively.

The curious tale of how the brain got to McMaster University, in Hamilton, Ontario, is also fascinating. In 1955, when Einstein died at the age of 76, Dr. Thomas Harvey removed the brain during the autopsy at Princeton Hospital in New Jersey. He kept it preserved in formaldehyde. This unauthorized appropriation of Einstein's brain appalled and outraged many scientists. However, the family agreed that Dr. Harvey could keep it for scientific study. Over the next four decades, Dr. Harvey seemed to do little further investigation of the brain. For a while, according to several reports, he stored it behind a cooler in his office.

Finally, in 1996, Dr. Harvey gave his data and a significant fraction of the brain itself to Dr. Sandra Witelson, a neuroscientist at McMaster who maintains a "brain bank" for comparative studies of brain structure and function. Dr. Witelson and her team compared Einstein's brain tissues with those from males close to his age, whose intelligence had been carefully assessed before death.

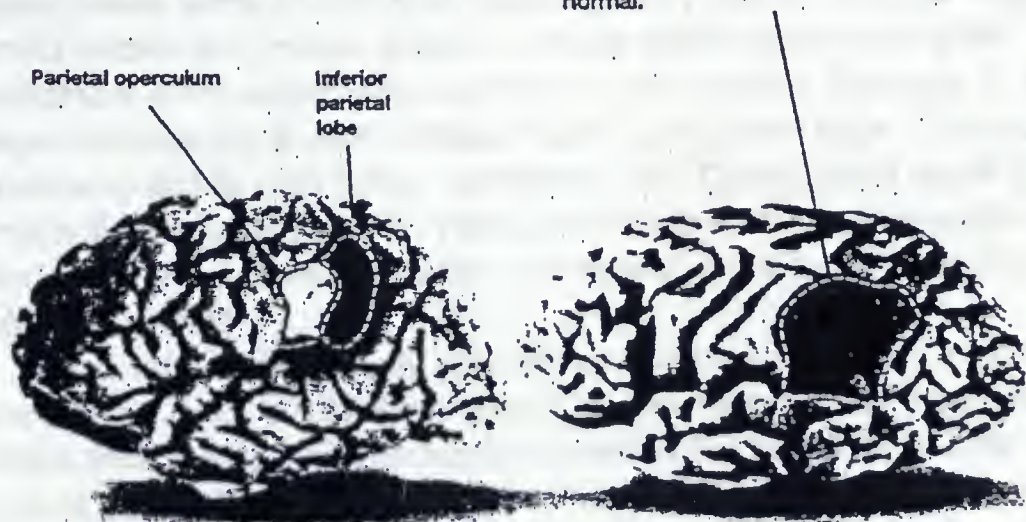
They found that a region which controls spatial awareness, mathematical thought and imagery of movement (called the inferior parietal lobe) was about 15% wider than normal. We know that Einstein's insights tended to come from visual images which he translated into mathematical language. For example, one of his famous theories came from Einstein imagining himself riding through space on a beam of light. Another feature of his brain was that separations between sections were smaller than normal. Einstein's brain cells were packed more closely together, permitting more interconnections. According to scientific theory, this can result in increased cross-referencing of information and ideas, leading to great leaps of insight. 5

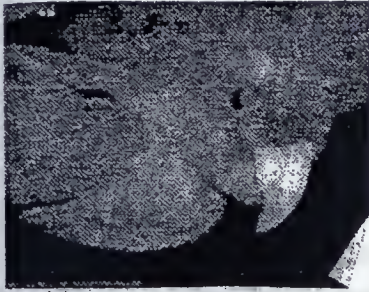
While this theory fits current neurological thinking, that doesn't necessarily make it true. We know Einstein was a genius, and we now know his brain was physically different from average. But this doesn't prove a cause-and-effect relationship. We need to examine the brains of other mathematical geniuses to see whether similar characteristics are present. Even if they are, it's possible that the bulked-up brains result from strenuous mental exercise, rather than in-born features that make genius possible. Although Canadian scientists have made a fascinating discovery, we still don't know whether Einstein was born with an extraordinary mind or whether he developed it, one brilliant idea at a time. 6

Why Einstein Was Einstein And You're Not

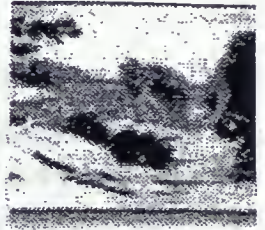
NORMAL BRAIN contains regions called the parietal operculum and the inferior parietal lobe; the latter is the seat of mathematical and visual reasoning.

EINSTEIN'S BRAIN was no bigger than most, but the parietal operculum region was missing. This allowed the inferior parietal lobe to grow 15% wider than normal.





Endangered Animals



The dinosaurs that once roamed the earth have all disappeared. Everyone is aware that they are extinct now, but we are fascinated with what they must have been like. We cannot observe them to find out about their habits, nor can we know for certain what they looked like. All that we know about dinosaurs comes from guesses and theories we develop as their remains are found.

Dinosaurs are not the only animals that have become extinct. Once, North America was full of animals called mammoths. They looked a lot like the modern day elephant, but they were covered with long hair. Hunters found mammoths to be a rich source of food, skins for clothing, and bones for tools. There were so many mammoths that people did not worry about wasting the meat or skin. The mammoths could not reproduce quickly enough to replace the numbers that were killed by hunters. It did not take long to wipe out the entire species. Today we have a pretty good idea of what the mammoth looked like because ancient cave artists left us a few drawings of the beasts.

During the past few hundred years man has hunted many animals to extinction. The moas (large flightless birds) of New Zealand were easy to kill and tasted pretty good. It took only 200 years to make the moas extinct. Dodo birds were found in abundance on the Mauritius Islands in the Indian Ocean. It was a strange looking bird with a large head and short legs. They could not move quickly and were unable to fly. Dodo birds were so easy to catch that it only took 70 years for them to become extinct. The Stellar's sea cow, related to the manatee, took only 27 years to become extinct!

Food was not the only reason animals have been hunted into extinction or near extinction. The Carolina parakeet had beautiful feathers that were popular fashion trends for hats. That bird became extinct because people thought it was pretty. Beavers

were hunted for many years because their fur was used to make coats and hats. By 1800 the beaver population had dropped drastically and they were much more difficult to find. Fortunately trends changed about then, and beaver was no longer desirable. The beavers were saved, not because they were nearing extinction but, rather, because their fur was not in fashion!

Many other animals have become endangered, or close to extinction. In the 1920's, thousands of elephants were killed for their ivory tusks. The ivory was fashioned into piano keys and billiard balls. The bald eagle was considered quite a trophy to stuff and hang on walls. It was hunted until there were very few left. Whales, sea turtles, and panda bears are a few examples of animals on the endangered species list.

Animals, like all our other natural resources, are not limitless. When one species becomes extinct, it is not just that animal that is affected. Other animals that depended on that species for their own survival are affected, too. The entire ecological system is changed because of the disappearance of one species. The Endangered Species Act of 1973 is a law created to protect animals in danger of becoming extinct. The Act makes it a crime for anyone to sell or transport endangered animals or products made from endangered animals. The law also sets aside certain lands that are natural habitats (living areas) of these animals. By protecting these animals, we can prevent the needless extinction of any more of our wildlife. Our descendants in the future will not need to rely on books and pictures to tell them what elephants and whales looked like. They will be able to see the animals for themselves.



Session #1: Introduction to Reading Strategies

Implicit Instruction

Throughout this session you have been taught the before and during reading strategies that must be used in order to form a better understanding of written text. You have also had the opportunity to see some of them in action from the article, "The Expert is In". (This article was read aloud during session in order for students to understand how each strategy is thought through as one is reading text.) The story had 2 fonts. The bolded words were the text as it appeared on the overhead of the article. Interspersed within the text was a lighter text which was the running dialogue as I modelled the piece. This part of the session was done for both groups and the students viewed the article on an overhead in order to determine what was printed and what was coming from my head.

Since you have had the opportunity to listen to an article that incorporated reading strategies, now it is time to put these reading strategies to use when you are reading a story.

Before you begin, we will review each of the strategies on your chart and discuss how they will help you to better understand and remember the content of the story.

Class Discussion: Before you start reading any type of text what are some strategies that you can rely on?

- 1) Knowing Why we are reading something: to learn something new, to show that you understand, for fun
- 2) Choose Your Approach: read top to bottom, slowly carefully, start with title, pictures etc...
- 3) Recall: What do you already know about the topic?

While you are reading a story what strategies should be running through your head?

- 1) Using Text Layout: bold, heading, pictures, paragraph divisions
- 2) Make Connections: compare what the author says to your own experiences and opinions
- 3) Get Involved: Highlight key points, ask questions
- 4) Make Pictures: make a little movie of the action in your head
- 5) Stuck on a New Word: Notice what is going on around the word
- 6) Pay attention: confused? Stop. Go back and reread... what did you miss?

Move into a discussion which focuses on the specific reading strategies that we had emphasized in this session.

Before Reading: 1) Knowing Why: Why are you reading this text?

2) Choose your Approach: How should I approach the text?

3) Recall: What do I already know about the topic in this story?

During Reading 1) Text Layout: Are there any pictures or different fonts I that I can rely on to make more meaning?

2) Make Pictures: I should try to make a mental picture of the events in the story.

You had probably noticed that we did not incorporate and use all of the reading strategies that are found on the chart. It is important to realize that each reading situation is different and that you need to choose the strategies that are most applicable to the

reading selection at hand. It is important to know all the strategies so you can select the ones that will help you understand the text best.

Students will be given two stories to read independently (Einstein's Brain: Built for Brilliance and Endangered Animals). They are to apply the before and during reading strategies that we had focused on during this session. Both of the stories will be informational texts that contain pictures. This will ensure that the text is similar and they are given the opportunity to practice the strategies on two stories of similar format and style.

Once the students have completed reading the first story entitled "Einstein's Brain: Built for Brilliance", the teacher will take the story up with the class, incorporating questions that relate to the before and during reading strategies they had relied on when reading. This class discussion will allow students to take up the story and describe the strategies they had used to form and understanding of the text.

Following the "take up" of the first story, students will then be instructed to read the second story "Endangered Animals" independently.

Session #1: Introduction to Reading Strategies

Explicit Instruction

State Content & Process Goals

During today's session we've discussed some before, during and after reading strategies that will help you improve your comprehension. You can use these strategies to better understand written text. In order to help you remember the strategies, you have been given a chart that outlines all of the reading strategies you should use before, during, and after reading. You can rely on this chart when you are reading any type of text. You will find that you will apply the strategies that best suit the form of text that you are reading.

The activity that you will be working on today will require you to practice the before, during, and after reading strategies while reading Informational text. You will be focusing on specific strategies from the chart in order for you to develop a better understanding of the text that you are reading.

Share a Personal Learning Story Related to Strategy Use and Increased Learning

I am going to share a story with you about an experience that my friend and I had when we were reading stories in middle school. My friend had always struggled with reading, and she was very weak at understanding the meaning of stories. After we had both read the same story, she had a hard time explaining what the story was about. I would ask her how she started to read and I noticed that she would skip some important parts of the story. She would ignore the title, jump right to the first line and read all the way to the end and then decide whether or not it made sense. She also never thought about what she already knew about the story topic and didn't pay attention to any of the pictures that were a part of it. Today, I am going to share the steps involved in using before, during and after reading strategies so you will not have the negative and stressful experiences that my friend had.

State Why the Strategy is Useful

I am going to explain why the before, during, and after reading strategies provided on the chart will benefit you in understanding the material in written text. If you look at the first strategy which focuses on knowing "why" you are reading about something, it will help you remember the story more easily. You may be reading something for pure enjoyment, to learn something new but in this case you're going to read this story to prove that you understand its content. Another strategy that is useful is "scanning" the story to find specific details and to ask yourself what you already know about the topic. This will allow you to place more of a focus on the information in the text and help you understand and remember new information more easily. While you are

reading, it is also useful to apply the strategy of text layout which focuses on paragraph divisions, italics, and any pictures that may be part of the story. Another useful strategy to rely on when reading a story is to make pictures of it in your mind and create a little movie of the actions taking place. This allows you to create a mental picture which will help in remembering the important points in the story.

State When and Where the Strategy can be Used

The strategies that I've just described are only a few of many more on the chart that you have in front of you. You must realize that I did not explain all of the strategies because each reading situation is different and some strategies may be more applicable to a story than others. If a story does not have pictures, then you wouldn't be able to use that strategy. You must adjust your strategy choice to the written text you are reading. For this reason, it is very important to know ALL the strategies so you can select the ones that are useful to each situation.

You should use as many as possible of the before, during and after reading strategies every time you read. For example, you can use the "knowing why you are reading something" along with the "recall" strategy, which involves asking yourself what you already know about the topic or story. Each of the reading strategies on your chart can be used with the many different forms of text that you read. Using the strategies before, during, and after reading will help you remember and understand the information better. Remember to ask yourself questions throughout the read because this will also help you develop a strong understanding of the story. When the information is meaningful to you, it will also be easier to remember.

Model the Strategy

Put a copy of the reading strategies chart on the overhead. Ask students to place their copy on their desks. Hand out a copy of the story, "The Expert is in". Read it aloud together. As I am reading the story, I am thinking out loud as to how I would approach the story and will talk in two different tones so they can distinguish my thoughts from the written text. For example, a skilled reader would approach it something like this (Bolded Material is the text from magazine. My comments (italics) incorporate how I am using the reading strategies to engage with the author.

I found this article on the back page of a magazine I like, "Canadian Home Workshop"-The do-it-yourself magazine", June 2002. It looks like it might be fun, perhaps a chance to pick up a do-it-yourself tip. I'll start with the title to see what his subject is today.

**Excerpt from, The Expert Is In
Advice from the cutting-room floor, by Paul Rush**

I like advice. Let's see what it's about:

Work shoppers always ask questions of experts and experts always oblige...Oddly enough, sometimes people ask me questions. But they aren't really looking for advice; rather, they wonder how I manage to get through a single day in the shop without doing something – or someone – serious harm...Take a look at these questions and answers and judge yourself. Sounds like it might be humourous, so I'll keep reading. I'll read it over quickly because it's unlikely to be "heavy stuff".

Question: What is your biggest failure? (*yup, it's intended to be humourous. Why else would a writer set himself up like this?*)

Answer: It's hard singling out any one failure because the list is so long. I built my first bookcase with a few nails and boards without any back bracing. (*does he mean metal brackets to hold the shelf to the wall?*) **The first book turned the shelving unit into a parallelogram.** (*Nope, not brackets I guess he meant there was no back to the shelf – just boards and ends. What a novel way to say it collapsed!*) **That was mortifying. Of course, I've also ruined many sheets of drywall. But my biggest failure occurred trying to take a tree down.** (*I know what that feels like – we had one land on the garage roof when we tried to take it down.*)

About five years ago, I was felling a large tree on a hillside near a power line. (*Oh-oh he's going to knock out the power for his whole neighbourhood!*) **Instead of dropping, the tree sat against the chainsaw blade.** (*oops, guess not*) **It trapped the saw and threatened to fall backwards and extinguish most of the municipality's lights.** (*I was close*) **I grabbed some rope (I always use rope when I cut trees), tied it to the tree and secured it to several other trees away from the power line. I attached a third rope to my come-along** (*what's that?*) **to pull the tree forward** (*must be some special kind of rope or pulling thing*) **but I didn't allow for the rope to stretch. After using all the wire cable the tree was still standing.** (*I've got a beautiful image of Wile E. Coyote trying to cut down a tree! Is he going to jump up and down on it?*) **I finally got it down with yet another come-along. (Yes, when I'm felling trees, I always have spare come-alongs and perhaps a block and tackle** (*heard of it- know it's something to make lifting easier*). **Maybe I'm not as good at tree felling as I think I am.)**

Well, that was entertaining. Didn't learn any good tips, but I think I'll share it with my husband – he'd get a kick out of it.

Now, students will be given their practice activities to complete. The first story entitled "Einstein's Brain" will be explicitly modelled to them and the second story, "Endangered Animals" will be read independently.

Hand out the Story, *Einstein's Brain* and have students refer to their chart as the teacher models the before and during reading strategies. (Questions in Bold, modelled answers in italics)

Q: Why are you reading this? *To prove that I can read, and understand the text.*

Q: Have you ever stopped before reading something to consider why you are reading it? If not, highlight that description on your chart to remind you that you need to start doing that. *To understand why you need to do that lets, continue down the chart.*

Refer to the chart Skilled readers choose their approach depending on why they are reading, the amount of time available, the type of text.

Q: With that in mind, how would you approach reading this selection?

- *Begin by reading the title because I know it will give me clues about what I'm about to read, (is it going to tell us why his brain made him brilliant?)*
- *I will also look at the pictures to see what information I can pick up here. This will give me clues about what I'll be reading (even though there are some big words, I can tell they are the names of parts of the brain. Being able to pronounce them would be nice, but if I can't that won't stop me from understanding their point. I see that the pictures are telling me that, although his brain was no bigger than a normal one, there was a missing region and that let another part of his brain get bigger than normal. This bigger part is used for mathematical and visual reasoning. So there was something different about his brain. Did that cause him to be a genius? I'll have to read the story to find out because it doesn't say here.)*
- *Now I'll read the story from beginning to end and highlight key points as I read (because I know they are going to ask me questions and this will help me focus my attention and to find important information more quickly when I need to).*

Q: Would you do these things before you begin to read? If not, highlight this section to remind you to start.

The final thing skilled readers do before beginning to read is recall what they already know about the topic.

Q: What do you already know about Einstein?

There are many things we could be reading about Einstein, but the title and the pictures at the bottom of the second page help us focus our attention.

Q: What specifically are we going to learn about him?

Something about his brain – perhaps how it is different

Q: Do you stop to think about what you already know about the topic before you read? If you don't highlight this section.

This is a critical reading strategy. It is useful before and during every reading activity.

Now, the teacher will read the entire selection aloud to the class. The teacher will pause at appropriate points to engage them in the use of the “during reading strategies”.

- *Anticipate and predict (start with the title)*
- *Stop sometimes for them to recap what the teacher has read*
- *Ask questions. Have them think of some. (e.g. How was his brain different? How did his compare with other smart people's? How did imagining riding on the beam of light through space help him come up with a mathematical formula?) Help them note that some questions are answered by text and some are not. That's to be expected. The act of thinking of questions makes the reader more involved in the reading activity and this dramatically improves comprehension and retention.)*
- *focus attention, “picture” what's going on (his brain, the autopsy, the brain in a jar of formaldehyde, behind a cooler in the office, a brain bank, ...)*
- *use the context to help them understand new words, when possible*
- *make note of key words (underline them on the overhead as you read)*
- *organize new information and combine it with what they already know (already knew he was smart- still didn't know why he was so smart, but we know part of his brain was bigger – either due to using it so much or perhaps he was so smart because it started out bigger)*

Q: Do you do all these things as you read? If there are any you do not do, highlight them.

In the sessions that follow, you will have the opportunities to practice the strategies you don't often think to use.

Hand out a copy of the second story entitled, “Endangered Species” and instruct students to read it independently applying the strategies that were modelled to them.

They are: **Before Reading** 1) Knowing Why 2) Choose your Approach 3) Recall

During Reading: 1) Make Connections 2) Get Involved 3) Make Pictures

Session 2

Preparations before class

Photocopy: one per student

- questions for Einstein's Brain
- Steps to Answering Comprehension Questions
- Einstein's Brain - More Practice

Make an overhead of

- Steps to Answering Comprehension Questions

Read over the comprehension questions and the answers. Be sure you have thought about how you arrived at the answers so that if students cannot articulate their steps and reasoning, you can jump in and model yours.

Session Overview

- discuss the 3 types of reading comprehension questions on the OSSLT
- identify key words in instructions and in questions
- identify each of the 3 types of questions and how that helps them locate the answer
- analyze the strategies and thinking involved in responding to reading comprehension questions
- answer all 3 types of questions for Informational text

Lesson

Hand out Steps to Answering Comprehension Questions and put a copy on the overhead

Tell them there are 3 types of questions they have to answer on the test. If they have their OSSLT results with them, have them take them out for a moment to refer to the chart to see how they did in the 3 types in response to Informational Text.

Today we are going to start applying a strategy that will help you recognize which type of question you are dealing with. We are going to begin using a series of steps I will have you go through for every question during these sessions. It will be repetitive after a while, but that will help you remember it better when you are under pressure during the test. It should also be useful to you for classroom assignments.

Begin by discussing the first 2 steps on the Comprehension chart. Have them practice by highlighting the key words in these 2 steps. Discuss their choices.

Step 3 has both visual elements and key words designed to act as memory triggers for how to approach answering each of the 3 types.

Briefly go over the 3 types of questions, the picture, and what that means. Discuss the examples of each type of question:




1. The answer will be right there on the page where you can point to it.
2. Often there will not be a word or phrase on the page that they can copy. This is a detective question. To answer correctly they'll need to search for the relevant part(s) of the text, then examine the clues the author has left to think about what it means. The answer is on the page, but they need to combine pieces of information or to make an inference.
3. Other questions require the reader to make a personal connection with the material. This is a partner question. A correct answer requires an understanding of the author's message plus personal input.

If you can do this kind of analysis, it will help you focus your attention in the right place. For example, when the answer to an inferential question is shown to some students, their comment will be, "Where does it say that?". Recognizing when a question requires an inference will prevent you from wasting time, and from picking incorrect multiple choice answers merely because some of the words matched the text.

<p>NOTE: My theory behind this approach is that people who easily locate answers to comprehension questions are doing this kind of process without conscious awareness or labels. We make a hypothesis about whether or not the answer will be directly stated, and we search accordingly. Sometimes our initial hypothesis is wrong, so we modify our approach. Poor readers don't do this on their own. They expect the answer to jump out at them or they give up and say, "It doesn't say!". By modelling this thought process you will provide them with a tool to increase their odds of a successful outcome.</p>

Steps to Answering Comprehension Questions:

1. Read the instructions at the beginning of the assignment. Underline the key words so you don't miss anything important. Follow the instructions precisely. Do them one sentence at a time if the instructions are several sentences long.
2. Highlight the key words in the question.
3. Decide which kind of question it is so you know whether you'll find the answer on the page or whether you'll need to bring in your own knowledge and experience too.

Type of questions	That means	Example
<p>Some ask you to locate directly stated information</p> 	<p>the answer will be right there on the page.</p> <p>Find a key word/phrase in the question to search for in the text. Scan the text to find the key word(s).</p> <p>Locate the answer.</p>	<p>"Where did they store Einstein's brain?"</p> <p>"Who decided to remove and keep Einstein's brain?"</p> <p>"What was different about this brain?"</p> <p>"Is it true that having brain cells packed more closely together leads to great leaps of insight?"</p>
<p>Some questions ask you to understand information that is not directly stated</p> 	<p>you will <u>not</u> find a line in the text that gives you the answer they want.</p> <p>Be a detective: <u>search</u> the text for information related to the question; <u>think</u> about what it means.</p> <p>Look for clues in the text.</p>	<p>"What is the best meaning for the word 'distinctive' as used in paragraph 2?"</p> <p>"What 2 pieces of evidence in the text indicate that perhaps Dr. Harvey didn't really know what to look for when studying Einstein's brain?"</p> <p>"Does this article reveal the cause of Einstein's brilliance? Explain your answer."</p>
<p>Some require you to make a connection between what you have been reading about and your own personal knowledge and experiences</p> 	<p>you will need to consider information the writer has provided, and add your own background knowledge to that.</p> <p>This a partner question.</p> <p>Information from both sources must be there or the answer will be incomplete.</p>	<p>"Why did the author include labelled diagrams with the text?"</p> <p>"Why do you think they chose to study Einstein's brain instead of one from a more average person?"</p> <p>"Is this a good title for this article? Explain your reasons."</p>

NOTE: sometimes it will be difficult to decide whether a question is a Partner or a Detective. Tell them not to worry. Sometimes there is a fine distinction between the two and it's not important enough to worry about. Both types of questions require them to combine information from the text with information from their head. Provided they can recognize that much, they will do OK.

The other significant piece to make note of from this exercise is that on the OSSLT they will never be asked to answer a question purely from their own head. It will always have to be connected to what the author had to say on the matter.

Group Practice

Hand out a copy of the first sheet of questions about Einstein's Brain to each student (answer keys are provided for you in the lesson plan). Point out to them that, on the OSSLT, the amount of space provided for an answer indicates the amount of information they are looking for.

Instruct the students to have Steps to Answering Comprehension Questions on their desk as they work on these questions.

Recommended Procedure

1. Together, do Step 1 from the Steps to Answering... sheet. Use this opportunity to reinforce the critical message that reading and following the instructions on the test can make the difference between passing and failing. For example, if the instructions ask them to write a summary of less than 100 words and they write more than 100, they will lose marks for "non-compliance" - even if it was a fabulous summary! Be sure they don't miss this point.

Now, still as a group, go through the following steps for each question before tackling the next question:

2. Examine the question as a group. Together, determine which are the key words. Discuss the potential errors they could make if they ignored some of the key words so they see how important this step is.
3. In the beginning, tell them which type of question you think it is and how knowing that can help them. As you see them "getting it", pull back and let them tell you.

How does identifying the type of question help?

If it seems like a right there type of question, a useful approach is to identify key words to scan for in the text that may help you locate the word(s) that will answer the question.

If it seems like a detective question, you know there's unlikely to be a word or phrase to point to, so don't waste time looking. Instead, search for related information and be prepared to infer the meaning based on clues the author has left.

If it seems like a partner question, you know to search for related information in the text, then compare that to your personal experiences and knowledge to construct an answer. It won't be on the page.

4. Provide a few quiet moments for each person to find and record the answer alone.
5. Ask for volunteers to share their answer aloud. Accept all answers without making comments which indicate whether each was right or wrong.
6. Ask each volunteer to describe how they arrived at their answer. It is so valuable for them to think about how they arrived at an answer, and especially so for the ones who got it wrong. It helps them to see good strategies made explicit and to examine faulty logic or assumptions.
7. Be sure everyone is clear about why each answer is correct or incorrect.

About taking up answers (providing feedback)...

The most valuable part of each lesson will be the oral analysis of the mental processes behind reading and responding to the questions. Getting through all the questions and knowing the right answer is not the goal of these sessions. These selections and questions will not be on the test they write. What is important is to take your time and help each student to "see" the thought processes that go into arriving at the correct answer. They need to understand how people decide what the questions are asking and how they go about locating that information.

Merely knowing they are right (it could have been by accident) or wrong in a particular answer teaches them very little. The essence of the lesson is in the meaningful feedback you provide them with.

Practice

When you finish analyzing the assigned questions and answers as a group, give them the second sheet of questions to do in pairs. Encourage them to be looking for patterns or clues that will help them recognize each type of question. Stop for a group discussion of processes and decisions after each question (steps 2-7 above). With this modelling and support, they should get better as they go down the page. Keeping them together this way will improve learning and prevent you from having a group twiddling their thumbs because they raced through the answers.

Continually reinforce the message that their goal here is to come to an understanding of the mental processes involved in answering comprehension questions. Just getting these answers right is not enough. These questions will not be on the test.

Einstein's Brain: Built for Brilliance

(questions are from www.egao.com as they appeared on the October 2000 trial run of the Grade 10 literacy test. Instructions are from the author of this module)

Instructions:

Put your name and the date at the top left of this page. Circle the letter beside the correct answer. Answer question #3 with one word only.

1. What is the best meaning for the word "portion" as used in paragraph 2?

- a) age
- b) part
- c) whole
- d) appearance

2. Paragraph 3 adds to paragraph 2 by

- a) stating an example
- b) showing cause and effect
- c) providing background information
- d) rewording the ideas in paragraph 2

3. What did Dr. Harvey use to preserve Einstein's brain? (Paragraph 3)

4. What is one unusual physical feature of Einstein's brain?

5. Explain why it is important to study a brain like Einstein's

Einstein's Brain: Built for Brilliance

(teacher copy - EQAO answers and rationale follow)

(questions are from www.eqao.com as they appeared on the October 2000 trial run of the Grade 10 literacy test. Instructions are from the author of this module.)

Instructions:

Put your name and the date at the top left of this page. Circle the letter beside the correct answer. Answer question #3 with one word only.

1. What is the best meaning for the word "portion" as used in paragraph 2? - detective because there is unlikely to be a word or phrase to point to which gives the answer. They must search for clues in the context.

A	age
B	part
C	whole
D	appearance

2. Paragraph 3 adds to paragraph 2 by - detective because there is unlikely to be a word or phrase to point to which gives the answer. They must read both paragraphs, analyse what each is about, then analyze the relationship between the two; then use the process of elimination

A	stating an example
B	showing cause and effect
C	providing background information
D	rewording the ideas in paragraph 2

3. What did Dr. Harvey use to preserve Einstein's brain? (Paragraph 3) - Right there - because the average person is unlikely to know this, the author has probably told us directly. You can point to it.

4. What is one unusual physical feature of Einstein's brain? - same as #3 - right there

5. Explain why it is important to study a brain like Einstein's - Could be any of the 3. Scan to see if it's right there. Quickly see it isn't stated. Does he give clues? Sounds more like we're being asked for our opinion. The reader must understand from the text why they are studying his brain, then apply personal knowledge about life and learning to formulate an opinion as to why this is important. Turns out it's most like a partner question.

Einstein's Brain: Built for Brilliance

multiple choice

Question (as it appeared on October 2000 trial administration)

1. What is the best meaning for the word "portion" as used in paragraph 2?
- A age
 - B part
 - C whole
 - D appearance

Question (with explanations for best or most correct answer)

Skill: understand ideas and information stated directly in the reading selection

1. What is the best meaning for the word "portion" as used in paragraph 2?
- A age
[*"age" is a measurement of time*]
 - ☒ B part
[*"part" is a synonym for "portion"*]
 - C whole
[*a "whole" is made up of its "portions"*]
 - D appearance
[*"appearance" is what a thing looks like*]

Einstein's Brain: Built for Brilliance

multiple choice

Question (as it appeared on October 2000 trial administration)

2. Paragraph 3 adds to paragraph 2 by
- A stating an example.
 - B showing cause and effect.
 - C providing background information.
 - D rewording the ideas in paragraph 2.

Question (with explanations for best or most correct answer)

Skill: understands indirectly stated ideas and information

2. Paragraph 3 adds to paragraph 2 by
- A stating an example.
[paragraph 3 does not provide an example of a statement in paragraph 2]
 - B showing cause and effect.
[the information in paragraph 2 is not the cause or effect of anything in paragraph 3]
 - ☒ C providing background information.
[paragraph 3 explains the circumstances that made it possible to analyze Einstein's brain as described in paragraph 2]
 - D rewording the ideas in paragraph 2.
[paragraph 3 does not reword the information in paragraph 2]

Einstein's Brain: Built for Brilliance

written answers

Question (as it appeared on October 2000 trial administration)

3. What did Dr. Harvey use to preserve Einstein's brain? (paragraph 3)

Condensed Answer Key

Skill: understand ideas and information stated directly in the reading selection

Correct	<p><i>Answer is directly stated in the text.</i></p> <p>a) formaldehyde (<i>only correct answer</i>)</p>
Incorrect	<p><i>Answer does not demonstrate reading comprehension of the text or demonstrates a misreading of the text or question. As a result the answer may be inaccurate, implausible or insufficient.</i></p> <p>a) stored it behind a cooler in his office (<i>storage location was not a factor in the preservation of Einstein's brain</i>)</p> <p>b) He removed the brain. (<i>removing Einstein's brain did not help to preserve it</i>)</p>

Einstein's Brain: Built for Brilliance

Question (as it appeared on October 2000 trial administration)

4. What is one unusual physical feature of Einstein's brain?

Condensed Answer Key

Skill: understands indirectly stated ideas and information

Correct	<p><i>Answer is a generalization or conclusion from explicit and implicit information in the text.</i></p> <p>a) The inferior parietal lobe portien- the portien which controls mathematical and visual thinking- was 15 per cent bigger than average. <i>[answer identifies a physical feature of Einstein's brain that was unusual]</i></p> <p>b) Einstein's brain cells were packed more closely together. <i>[answer identifies a physical feature of Einstein's brain that was unusual]</i></p>
Incorrect	<p><i>Answer does not demonstrate reading comprehension of the text or demonstrates a misreading of the text or question. As a result the answer may be inaccurate, implausible or insufficient.</i></p> <p>a) One of the physical feature of Einstein brain is that there is a lot of characterists <i>[answer does not name an unusual physical feature]</i></p> <p>b) his brain was missing the parietal operculum his brain was no different <i>[the second part of the answer contradicts the first part, making the answer inaccurate]</i></p>

Einstein's Brain: Built for Brilliance

Question (as it appeared on October 2000 trial administration)

5. Explain why it is important to study a brain like Einstein's.

Condensed Answer Key

Skill: making connections between personal knowledge and experience and the ideas and information in the reading selection

Correct	<p><i>Answer connects ideas and information in the text with personal knowledge and experience to provide an explanation.</i></p> <p>a) So that we can understand why he was such a genius and to compare his brain with other geniuses. <i>[answer explains how information about Einstein and other geniuses' brains will increase knowledge about how brains function]</i></p> <p>b) If it is possible to make a brain like this we could all have advanced brains. <i>[answer connects studying Einstein's brain with possible advancements in brain research]</i></p>
Partly Correct	<p>Answer indicates comprehension, but is too general or omits a needed explanation or does not make the connection back to the text.</p> <p>a) he was a very intelligent person, we can learn from him. <i>[answer is too general]</i></p> <p>b) To figure out how this happened and see how this happened. <i>[the use of "this" in the answer results in an unclear explanation]</i></p>
Incorrect	<p>Answer does not demonstrate reading comprehension of the text or demonstrates a misreading of the text or question. As a result the answer may be inaccurate, implausible or insufficient.</p> <p>a) Because he had made a lot of stuff in his life. <i>[answer does not offer a reason for studying a brain like Einstein's]</i></p> <p>b) because he's brain is wider than the normal brain that doesn't make him smarter. <i>[answer does not address question]</i></p>

Einstein's Brain - More Practice

Answer the questions below with a partner. Stop after you finish each question to discuss your decisions with the whole group.

1. What did Dr. Witelson and her team do with Einstein's brain?

Type: Answer:

2. What was the first doctor's impression when he studied Einstein's brain?

Type: Answer:

3. What does "appropriation" mean as used in the 3rd paragraph?

Type: Answer:

4. What was the reaction of some scientists when Dr. Harvey removed Einstein's brain for scientific study? Why did they feel that way?

Type: Answer:

5. If they studied the brains of other mathematical geniuses and found the same features as they did when studying Einstein's, would that prove that geniuses are born with a different brain than the rest of us? Explain how you decided.

Type: Answer:

6. Does the information in paragraph 2 support the following conclusion? Explain your answer. "The cells in Einstein's brain that govern mathematical ability and spatial reasoning were more closely connected, and therefore, worked together more effectively."

Type: Answer:

7. Does the information in paragraph 5 support the following conclusion? Explain your answer. "Because Einstein's brain cells were packed closely together, he was able to experience great leaps of insight."

Type: Answer:

Einstein's Brain - ANSWER KEY

Answer the questions below with a partner. Stop after you finish each question to discuss your decisions with the whole group.

- 1 What did Dr. Witelson and her team do with Einstein's brain?

Answer: compared it to brains of males same age - paragraph 4 - right there

- 2 What was the first doctor's impression when he studied Einstein's brain?

Answer: he thought it was just like everyone else's - paragraph 1 - right there

- 3 What does "appropriation" mean as used in the 3rd paragraph?

Answer: removal, taking, cutting out of,.... - must be detective - look for clues around the word as to what it must mean

- 4 What was the reaction of some scientists when Dr. Harvey removed Einstein's brain for scientific study? Why did they feel that way?

Answer: they were "appalled and outraged" - right there.

Because he did not have permission to remove it, and it's wrong to take something without asking - partner - look at evidence in text and compare with own knowledge of the world

- 5 If they studied the brains of other mathematical geniuses and found the same features as they did when studying Einstein's, would that prove that geniuses are born with a different brain than the rest of us? Explain how you decided.

Answer: No. Sounds like a thinking question at first, but on checking text, it's right there , The text points out that the differences could be a result of "strenuous mental exercise" rather than something they were born with - paragraph 6 - right there

- 6 Does the information in paragraph 2 support the following conclusion? Explain your answer. "The cells in Einstein's brain that govern mathematical ability and spatial reasoning were more closely connected, and therefore, worked together more effectively."

Answer: No. the text says, "may have been" and "could have" . This one is definite. My background knowledge of the significance of those words tells me there's a difference in meaning - partner

- 7 Does the information in paragraph 5 support the following conclusion? Explain your answer. "Because Einstein's brain cells were packed closely together, he was able to experience great leaps of insight."

Answer: No because they used the word "theory" which means it hasn't been proven, so can't make that conclusion - no way to know right now. I used words in the text plus my personal knowledge of the significance of that word to answer - partner

Session #2 : Steps to Answering Comprehension Questions

Implicit Instruction

Throughout this session you have been introduced to the three types of reading comprehension questions that are found on the Grade 10 Literacy Test. During this activity, you are going to apply the three step strategy of reading the question, highlighting the key words, and determining the question type that we have focused on in this session to answer each type of question. It is important to follow the three steps that we have stressed today in order for you to determine the correct answer to each type of question. It will be repetitive after a while, but that will help you remember it better when you are under pressure during a test.

Before you begin, let's review and discuss the three steps you should follow when answering any type of reading comprehension question.

- 1) Read question and Instructions carefully: When you come across the question do you take the time and read each word in the sentence carefully to ensure that you have a good understanding of what it is asking? Do you read over the instructions that are given to make sure that you are following them?
- 2) Underline or highlight key words: Do you take the time to highlight or underline the key words that will help you determine the correct answer?
- 3) Decide whether it is a direct, detective or partner question: After having read the question, do you take the time to determine whether the question would be found directly in the text, whether you have to search the text for clues, or if you have to rely on the text along with your prior knowledge to come up with the answer?

Now, let's review the three different types of questions and how each should be answered:

- 1) Direct – The answer can be found directly in the text. Once you have read the question you can scan the text to find the key word(s) that will provide you with the answer.
- 2) Detective – This type requires you to understand information that is not directly stated. You will not find a line in the text that gives you the answer they want. Instead, you have to be a detective and search the text for information related to the question and think about what it means.

- 3) Partner– This type of question requires you to understand the information the author has provided and add your own background knowledge to it. Information from both sources must be there or the answer will be incomplete.

Handout both sets of practice questions Einstein's Brain: Built for Brilliance and Einstein's Brain: More Practice. Once students have completed the first set of practice questions, take them up with the class. The take up will be structured in the form of a discussion in which students will provide responses to the questions and how they detected the different types. The discussion will also be based on having students describe the strategy they had used to derive at the final answer.

Once the discussion is complete, students will receive the second set of questions and will be instructed to complete them independently, reinforcing the three step strategy taught in this session.

Session #2: Steps to Answering Comprehension Questions

Explicit Instruction

State Content & Process Goals

Today you have learned about the three types of reading comprehension questions (direct, detective, partner) that are found on the Grade 10 Literacy Test. During today's activity you are going to apply the 3 step strategy we have discussed in order to help you recognize each type of question. This will enable you to begin using a series of steps when answering the questions. It will be repetitive after awhile, but that will help you remember the strategies better when you are under pressured situations.

Share a Personal Story Related to Strategy Use and Increased Learning

Whenever I had written a test in school, I always did very well when I followed the three very important steps discussed during this session. I always started the test by reading the instructions carefully. Once I understood what they were asking, I underlined or highlighted the KEY words. I then took my time in deciding what kind of question it was (direct, detective, partner) so I would know whether I would find the answer directly on the page, or whether I would have to be a detective and look for clues in the text related to the question. The last type of question would indicate that it is a partner type, in which I need to consider the information in the text and ADD my own prior knowledge to it. If I did not follow each of the steps, and rushed through the test, my test score was much lower and I was not pleased with my mark.

State Why the Strategy is Useful

If you rely on this strategy which involves the three very important steps it will help focus your attention on the question you are answering. Once you have read and understood the question and have also determined its type, you will be much more knowledgeable on how it should be answered. If you have determined that it is a direct question, then you will know to look for a key word/phrase from the question in the text. If the question is a detective type, then you will not find a line in the text that gives you the correct answer. You must search the text for information related to the question and think about what it means. This will help you look for "clues" in the text. If the question is a partner type, then you will need to consider the information the writer has provided and add you own background knowledge to that. Information from both sources must be present or the answer will be incomplete.

State When and Where Strategy Can Be Used

You should be using this three step strategy when answering any type of reading comprehension question. For example, you may come across a question that requires you to understand information that is NOT directly stated. In this case, you will have to rely

on specific clues that will help you locate the answer. Using this three step strategy will help you stay focused on each question and should prevent you from feeling confused when answering questions. Remember to read the instructions carefully, highlight key words and identify the type of question. This strategy should prevent you from wasting time and should help build your confidence when answering each question on a test.

Model the Strategy

As a class, let's review the three step strategy involved in answering reading comprehension questions.

Instructions:

Put your name and the date at the top left of this page. Circle the letter beside the correct answer. Answer question #3 with one word only.

Before I begin the test I must read each question carefully.

1) What is the best meaning for the word "portion" as used in paragraph 2?

Now, I am going to underline the key words in the question.

1) What is the best meaning for the word "portion" as used in paragraph 2?

After having read the question I decided that the key words to underline are "best meaning, word, portion, and paragraph 2". Each of these words provides me with a good understanding of what I am to focus on in the answer. I know I have to find the "best meaning" of the "word", "portion", found in "paragraph 2". These words tell me exactly what I am searching for and where to find the word in the text.

Now I have to determine if this is a direct, detective or shared type of question?

After having read the question, I am asked to define a word found in the second paragraph. Since the word is found in the text, I must read it over to see if they define it directly in the text. Unfortunately, they did not provide its meaning, therefore it must be a detective type question. I will have to go back to the paragraph and substitute the words offered in the answer to see which one fits best with the meaning of the sentence. I will have to rely on the other words in the sentence, which will serve as clues in defining the word portion.

- a) age
- b) part
- c) whole
- d) appearance

Age is a measure of time and that doesn't seem to fit well. Part is a synonym for portion and that meaning seems to fit in. Whole is made up of portions, so that wouldn't work

and appearance relates to what a thing looks like and that does not seem to fit in at all. Based on the words, I will have to choose "b" part, because it is a synonym for the word portion which is exactly what I am looking for.

Remember, read the question carefully.

2) Paragraph 3 adds to paragraph two by:

Now I have to underline the key words in the question

2) Paragraph 3 adds to paragraph two by:

I chose to underline the entire phrase "paragraph 3 adds to paragraph 2" because each of the words in the phrase provides me with important information in answering the question. I know that I have to go back and read paragraph 2 and 3 over again. Once I have read them, I have to determine how the third paragraph adds to the second. Each of the words in that phrase are crucial in forming an understanding of the question.

Now I have to determine the question type. Well I think it has to be detective because I will have to search the text for information related to the question and then think about how paragraph 3 adds to paragraph 2. There is unlikely to be a word or phrase to point to which gives the answer. I must read both paragraphs, analyze what each is about, then analyze the relationship between the two; then use the process of elimination to pick the best answer.

- a) stating an example
- b) showing cause and effect
- c) **providing background information**
- d) rewording the ideas in paragraph 2

In looking at "a" stating an example, paragraph 3 does not provide an example of a statement in paragraph 2 so that cannot be the answer. The answer in "b", showing cause and effect doesn't fit well because the information in paragraph 2 is not the cause or effect of anything in paragraph 3. The answer in "c", providing background information seems to fit quite well because paragraph 3 explains the circumstances that made it possible to analyze Einstein's brain as described in paragraph 2. The answer in "d", rewording the ideas in paragraph 2; doesn't fit well because paragraph 3 does not reword the information in paragraph 2. Well, I believe that "c" providing background information must be the answer to question 2.

Remember, read the question carefully.

3) What did Dr. Harvey use to preserve Einstein's brain? (Paragraph 3)

Now I have to underline the key words in the question.

3) What did Dr. Harvey use to preserve Einstein's brain? (Paragraph 3)

I decided to underline the following words, "Dr. Harvey, use, preserve, and Einstein's brain" because each of them is important in determining the correct answer. When I go back to the text I will specifically look for the words underlined in order to find the best answer for this question. As I scan the text, my focus is on finding Dr. Harvey's name closely connected to something that he may have used to preserve Einstein's brain.

Now I have to determine the question type. Well, it must be direct because the average person is unlikely to know this, the author has probably told us directly and I'm sure I will find it right in the text.

After having read over paragraph 3, I found the answer directly stated in third sentence. The answer is formaldehyde.

Remember, read the question carefully.

4) What is one unusual physical feature of Einstein's brain?

Now I have to underline the key words in the question.

4) What is one unusual physical feature of Einstein's brain?

*The key words that I have underlined here are, "one unusual physical feature and Einstein's Brain". These words are very important in determining the final answer. I know that I only have to find **one** feature that is unusual and that feature must be from **Einstein's Brain**. These words are important and will help me find the answer that I am looking for when going through the text.*

Now I have to determine the question type. Well, it must be direct because the average person is again unlikely to know this, the author has probably told us directly and I'm sure I will find it right in the text.

After having read over that section of the story, I had directly found two unusual physical features stated. One is that the inferior parietal lobe portion which controls mathematical and visual thinking was 15% bigger than average. The other is that Einstein's brain cells were packed more closely together than average. Therefore, either answer must be correct in this case, so I will write the second one that I had found based on Einstein's brain cells.

Remember, read the question carefully.

5) Explain why it is important to study a brain like Einstein's.

Now I have to underline the key words in the question.

5) Explain why it is important to study a brain like Einstein's.

The key words that I had underlined are very important in helping me find the correct answer. The first underlined word "why" tells me that I have to provide a reason that will explain the importance of studying a brain like Einstein's.

Now I have to determine the question type. Well it could be any of the three. I'm going to scan to see if it's right there. It isn't but does the author give clues? After being a detective while reading, it seems as if I'm being asked for my opinion. Therefore, this is a partner question. This means that I, the reader must understand why they had studied Einstein's brain, then add my personal knowledge about life and learning to formulate an opinion as to why this is important.

I have to make sure that my answer connects the ideas and information from the text with my personal knowledge and experience.

There are two possible reasons:

- 1) So that we can understand why he was such a genius and to compare his brain with other geniuses. (answer explains how information about Einstein and other geniuses' brains will increase knowledge about how brains functioned)*
- 2) If it is possible to make a brain like this we could all have advanced brains. (answer connects studying Einstein's brain with possible advancements in brain research)*

Summative Tests

THE DRY NIAGARA FALLS RIVER DRY

On the night of March 29, 1848, the unthinkable happened. The mighty Niagara Falls eased to a trickle and then fell silent for 30 puzzling hours. It was the only time in recorded history that this wonder of the world had been stilled. So incredible was the event that three decades later eyewitnesses were still being asked to sign declarations swearing that they were there when the Falls of Niagara ran dry.

Residents first realized that something was wrong when they were awakened by an overpowering, eerie silence. Inspection of the river by torches revealed only a few puddles of water in the river bed. The next morning, some 5000 sightseers from as far away as Hamilton and Buffalo jammed the roads to Niagara Falls and converged on the riverbank to see the phenomenon. The American Falls had slowed to a dribble, the British Channel was drying fast, and the thundering Canadian Horseshoe Falls were stilled.

For some, the event was an interesting curiosity. Peering down from the bank, they saw long stretches of drying mud, exposed boulders and chains of black puddles. Fish and turtles lay floundering in crevices. While thousands stood in disbelief, a few daredevils explored recesses and cavities at the bottom of the dry river gorge never before visible. They picked up bayonets, muskets, swords, gun barrels, tomahawks, and other relics of the War of 1812. Others took the historic opportunity to cross the river above and below the falls - on foot, on horseback, or by horse and buggy.

For superstitious people, the unusual silence and unexplained phenomenon was a portent of divine wrath or impending doom. As the day wore on, fear and anxiety spread. Thousands attended special church services on both sides of the border. Native people in the area shared in the belief that some disaster was bound to happen.

Tension grew until the night of March 31, when a low growl from upstream announced the return of the waters. Suddenly, a wall of water surged down the river bed and over the falls. The deluge quickly covered the massive boulders at the base of the falls and restored the everpresent Niagara Spray. Relieved residents realized and returned home to sleep again to the rumble and boom of the falls.

The cause of the stoppage, it was discovered later, was an ice jam that had formed on Lake Erie near Buffalo...The Combined force of wind, waves, and lake currents jammed hundreds of thousands of tonnes of ice into a solid dam at the neck of the lake and the river entrance between Fort Erie and Buffalo. Eventually, the ice cut off the water's flow and the basin downstream gradually dried out...

Will Niagara Falls ever run dry again? Probably not, at least not on its own accord. Since 1964, an ice boom has been positioned at the head of the Niagara River every winter to prevent the formation of ice blockages and safeguard hydroelectric installations.

The falls have been turned off, though. For seven months in 1969, the United States Army Corps of Engineers diverted the river to permit repairs to the eroding face of the American Falls. On six other recorded occasions, the American Falls have frozen over completely. February 1947 was especially cold and the channel on the north side of Goat Island, which separates the two falls, became completely blocked with large masses of ice. But not the Canadian Horseshoe Falls. With 10 times the volume of the American Falls, only once has its mighty roar been stilled - on that memorable March night in 1848.

Written By, D. W. Phillips

The Day Niagara Falls Ran Dry

Read the Narrative entitled, "The Day Niagara Falls Ran Dry". After you have read the story, answer the following comprehension questions.

- 1) What was the author's purpose of enlarging the font size in the first paragraph of the story?

/2

- a) to highlight the introduction of the story
- b) to grab the reader's interest and attention
- c) to show a contrast between the paragraphs
- d) to show that the author had done it accidentally

What strategy did you use to answer the question?

I relied on the text layout (enlarged font) and connected that with my prior knowledge of why it was done.

- 2) How many sightseers made their way to Niagara Falls once it had run dry?
(First, record the type of question. Is it a direct, detective or partner? How do you know? Then, provide the answer and explain the strategy you had used.)

/4

Question Type: Direct

How do you know? The answer can be found directly from the text.

Answer: 5000

What strategy did I use to answer the question? Read the text and found the key words.

- 3) Based on the sentence, "Suddenly, a wall of water surged down the river bed and over the falls.", what is the best meaning for "surged"?

/2

- a) sprayed
- b) gushed
- c) escaped
- d) trickled

What strategy did you use to find the best meaning of the word?

I relied on the words around it and substituted each of the options in the answer.

- 4) Which statement below would best explain why Niagara Falls ran dry?

/3

- a) the long stretches of drying mud and exposed boulders clogged it
- b) the swords, gun barrels, and tomahawks from the War of 1812 jammed it
- c) the massive power failure stopped the falls from flowing
- d) the icejam weighing hundreds and thousands of tonnes cut off the water's flow

Question Type: Direct

How did you know? The answer is directly found in the text.

- 5) How did people try to reduce their fear and anxiety once they realized what had happened to the Niagara Falls? /3

- a) they crossed the river by foot, horseback, or by horse and buggy
- b) they picked up swords, gun barrels and tomahawks from the war of 1812
- c) they met along the riverbank and tried to support one another
- d) they attended special church services on both sides of the border

Question Type: Direct

What strategy did I use to answer the question? I went back to the text and searched for the key words in the question to find the answer.

- 6) The story describes the incident as an "incredible event". Record the statement from the story that would justify this belief and explain why you think it was considered to be incredible. /3

So incredible was the event that three decades later eyewitnesses were still being asked to sign declarations swearing that they were there when the Falls of Niagara ran dry.

Since people were being questioned about the event thirty years after it had occurred, no wonder it was considered to be incredible.

- 7) The first paragraph states that "It was the only time in recorded history that this wonder of the world had been stilled". Yet, the last paragraph states, "On six other occasions, it had frozen over completely. Provide an explanation that would clarify this inconsistency. /3

In the first paragraph, they are referring to the Canadian Horseshoe Falls which had only been stilled once in recorded history. In the last paragraph, they are referring to the American Falls which had frozen over on six other occasions. This indicates that there are two sides to the Falls, an American and Canadian and they were referring to the Canadian one.

Question Type: Detective

What strategy did I use to answer the question? I had to search the text to find 'clues' that would explain this inconsistency.

- 8) What has been done to try and prevent the Niagara Falls from ever running dry again? /2

Question Type: Direct

- a) engineers from the U.S have designed a device that prevents ice jams from forming
- b) an ice boom is positioned at the head of the Niagara River every winter
- c) engineers have designed safeguard hydroelectric equipment for the falls
- d) the falls are turned off periodically and checked to make sure there are no ice jams

"The Earthride"

It took thousands of years for people to understand the relationship between the sun and the earth, and to figure out what makes day and night, seasons and climates. Now that we understand it, we can see examples and models of the earth/sun relationship in everyday life. You can find a ride at most amusement parks, for instance, that's called something like "the Octopus". If you can picture our planet circling the sun as if it were on the end of an invisible arm, then this kind of ride is a good model of the relationship between the earth and its sun. Our planet spins like a top at the same time that it circles around the sun at the centre of its orbit.

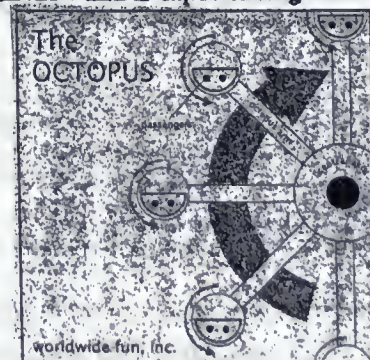
If you've ever been on the Octopus, you know that part of the fun is the fact that your body is going through two different motions at the same time: the seat you're sitting in is spinning around a pole that attaches it to the arm, and then the arm is circling around the centre. Let's call Earth's trip through space "the Earthride," and we'll take it a few steps further.

Most octopus rides dip up and down as they circle around the centre, but the Earthride stays level the whole way around. Most of them have many arms, all the same distance from the centre and all moving together. But the eight other arms on the machinery of the Earthride (each one represents one of the other planets in our solar system) all move separately and at different distances from the centre. Right now we are concerned with only one of the arms, and that, of course, is the one we're on.

The spinning seats on other octopus rides usually stay level with the arm and dip and climb with the ride. But our planet is attached to the Earthride at a slant, and while the arm stays level all the way around, the planet on the end is always tilted in the same direction. If you understand the tilt of our planet on the Earthride, then you have the key to understanding its seasons.

Not only is the pole that our planet spins around (called the axis) attached to the arm at slant, but no matter where the planet is on its journey around the centre of the ride, the axis remains tilted in the same direction. Sometimes the bottom part of the planet is tilting toward the centre, and at other times the top part is tilting in.

In the real Earthride, one year is the period of time it takes for the earth to make one complete trip all the way around its sun. When the bottom part of the planet, or the South Pole, is tilted toward the sun, then that part gets more heat and light and is experiencing what we call summer. At the same time that the South Pole is tilted toward the sun, the North Pole is tilted away from it; it is in shadow and is experiencing winter.



Name: ANSWER KEY
 Class: _____

The Earthride

Read the informational text entitled, "The Earthride". Once you have read the story answer the following comprehension questions.

- 1) Now that you have read the "The Earthride", why do you think the author included the pictures at the end of the story? How does this help you as the reader? /2

I think the author included the pictures to help understand the "Earthride" and make a picture of it in my mind. This helps the reader pick up information that is in the text and helps in giving clues as to what they will be reading.

- 2) What would be the 3 steps you would follow in order to answer this comprehension question. (List the steps in the correct order)
 "To understand the relationship between the earth and its sun, the author had provided an everyday life example of what type of model? /4

Step #1: Read the question carefully.

Step #2: Underline or highlight the key words.

Step #3: Determine the question type. (Direct, Detective, Shared)

Final Answer: A model of an amusement park ride called "The Octopus"

- 3) Paragraph 3 adds to paragraph 2 by: /3

- a) rewording the ideas in paragraph 2
- ~~b) providing detail on how the "Earthride" relates to our solar system~~
- c) comparing the "Earthride" to an Octopus
- d) describing the difference between summer and winter

Question Type: Detective

What strategy did you use to find the answer? I had to search the text for "clues" that would answer the question. (By reading Paragraph 2 + 3)

- 4) What is the biggest difference between the "Octopus" and "Earthride"? /3

- a) the Octopus is underwater and the Earthride is above water
- b) the Earthride has 8 arms whereas the Octopus has 10 arms
- c) the Octopus rides dip up & down but the Earthride stays level
- d) the Earthride spins in two directions whereas the Octopus does not

Question Type: Detective

How did you know? I had to search the text and find "clues" that would answer the question.

- 5) The author ends the second paragraph by using the phrase, "the Earthride". What does "the Earthride" refer to in the story: /1
- a) the movement of humans around the earth
 - b) the movement of the earth's trip through space
 - c) the movement of the earth and the planets around the sun
 - d) the movement of the planets around the sun

- 6) When the earth has made one complete trip all the way around its sun, what has occurred? /3

The period of one calendar year has past

Question Type: Direct

What strategy did I use to answer this question? I read over the text again to find the key words from the question. This provided me with the answer.

- 7) What is the biggest difference between how we on earth experience the summer and winter seasons? /2

The biggest difference is based on how the North and South Poles are tilted with respect to the sun. We experience summer when our South Pole is tilted toward the sun and the winter when the North pole is tilted away from it.

- 8) The eight other arms on the machinery of the Earthride all move: /2
- a) together and at different distances from the centre
 - b) together and at the same distances from the centre
 - c) separately and at the same distances from the centre
 - d) separately and at different distances from the centre

What strategy did I use to answer this question? I searched for the key words directly in the text and found the answer.

20

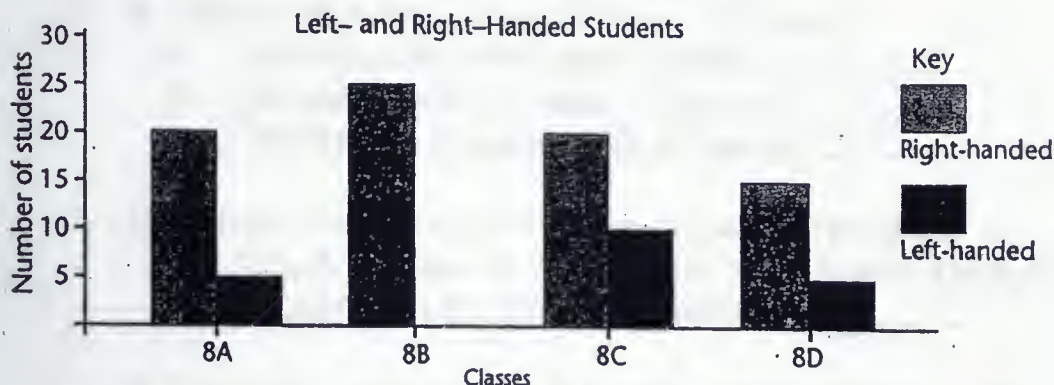
Name: Answer Key

Class: _____

The Number of Left-Handed and Right-Handed Students in Grade 8

Read the comparative bar graph below and answer the following questions.

The following comparative bar graph shows the number of left-handed and right-handed students in each of the four Grade 8 classes.



1) The numbers found on the x-axis represent: /3

- a) the four different Grade 8 classes
- b) the number of left handed students
- c) the number of right handed students
- d) the total number of students

Question Type: Direct

How do you know? I looked directly at the graph and on the x-axis. The title indicates that the classes are listed.

2) How many left-handed students are in Grade 8? /3

Question Type: Detective

What strategy did you use to find the answer? I had to search through the graph and add all left-handed students in each class.

Final Answer: 20

3) What information does the legend provide you with? /1

- a) the darker coloured bars represent the right-handed students and the lighter coloured bars represent the left-handed students
- b) the lighter coloured bars represent classes 8A & 8C and the darker coloured bars represent class 8B and 8D
- c) the lighter coloured bars represent the right-handed students and the darker coloured bars represent the left-handed students
- d) the darker coloured bars represent the students in classes 8A, 8B, 8C and 8D.

4) Identify and record 3 details provided by the graph. /3

- a) The title is Left and Right Handed Students.
- b) The y-axis represents the Number of Students
- c) There are no left handed students in Class 8B.

5) Provide 2 conclusions from the data displayed on the graph. /2

- a) Class 8C has double the number of left handed students than 8A + 8D.
- b) There are a total of 100 Grade 8 students.

6) The teacher combines class 8A and 8C to work together to complete their final Art assignment. The right handed students in each class are instructed to work in pairs with one set of scissors. How many scissors are necessary? /3

Question Type: Shared

How did you know? I had to connect the information from the graph with my prior knowledge of understanding the idea of "working in pairs".

- a) 40
- b) 15
- c) 20
- d) 55

- 7) The principal decided to close one of the grade 8 classes. Class 8B would be distributed among the other 3 classes. If the maximum number of students in a class is 30, how many students from 8B would be put into 8A, 8C and 8D? Are there

any students from 8B that are left over?

Question Type: shared

Answer: 8A 5 8C 0 8D 10

Are any students left over? 10

/3

- 8) If all the left-handed Grade 8 students were put into one class, how many desks would be required? /2

Question Type: Detective

What strategy did I use to find the answer? I searched
through each bar on the graph and added the left
handed bars together.

- a) 30
- b) 25
- c) 20
- d) 15

