The Effect of Working and Semantic Memory on Inferencing Comprehension

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Abstract

This study examines the connection between working and semantic memory and its effect on the reading process, specifically inferential comprehension. Research indicates many of the cognitive processes involved in inferential comprehension depend on the capacity and functionality of the working and semantic memory. Hypothesizing that inferential comprehension of the grade 3 and 4 participants was breaking down due to the processes required of the working and semantic memory, an organizational inferencing strategy was implemented. The strategy was designed to help students make connections between text and themselves, subsequently supporting inferential comprehension. Those connections can only occur if the ability to organize information in a systematic way is effective, which is dependent on the usage of available working memory capacity.

*Keywords: working memory, semantic memory, inferential comprehension, inferencing comprehension*
The Effect of Working and Semantic Memory on Inferencing Comprehension

Cognitive skills are the essential foundational competencies students use in order to learn. These skills may also be referred to as mental skills, intelligence, learning skills, learning tools or processing skills. In order for students to comprehend, reason, plan and problem solve, they must have these cognitive skills solidified. The way student’s process information determines what is truly learned and available for alternative applications or evaluations. Successful learners must be able to reference and recall information, process, analyze and store facts and feelings as well as have the ability to visualize, read words and truly understand concepts. The automatic and controlled processing of input material relies on the working memory and its buffer, semantic memory. There is a large body of evidence that working memory efficiency is one of the primary determinants of individual differences among readers (Just & Carpenter, 1992). Specifically, working and semantic memory impact one’s ability to make inferences from text. In order to understand the impact working and semantic memory has on inferential comprehension, it is important to establish clear definitions of both terms.

Defining Working Memory

Working memory is “a flexible, capacity-limited mental workspace used to store and process information in the service of ongoing cognition” (Morrison, 2011). Working memory (WM) is the ability to retain information for short durations and is the driver of the cognition processing required for thinking, problem solving, language, math, prediction and higher order skills like making inferences from text. WM capacity shares approximately 50% of the variance of people’s general fluid intelligence (Kane, Hambrick & Conway, 2005). WM is typically measured by complex span tasks that involve simultaneous storage and processing of
information. Attention and working memory are a team that evaluates input and keeps attention moving forward. WM holds the input and evaluates whether or not to hold the information for future use or discard it. The WM also has to hold information even with interfering distractions. Imagine, for example, working memory as a pie consisting of three quarters recall and one quarter perception or encoding. If there is a higher demand on encoding, then the amount of space left over for recall would be lessened. Or, if you increased noise level (perception), recall would worsen as space is more limited (Brady, 1992).

The WM has to prioritize input as capacity is limited. Preadolescents can handle an average of five items of information at once, while adults can handle an average of seven items (Sousa, 2004). By sequencing or categorizing input, one can better utilize the WM capacity and access information more easily at a later time. Essential in this processing are the components of the working memory, the phonological loop and the central executive system. Baddeley and Hitch (1974) concluded that the phonological loop is a part of the working memory specializing in retaining speech-based information. The central executive system regulates, manages and controls cognitive processes and contains three parts; the controlled attentional processing, visuospatial sketchpad and the episodic buffer. Controlled attentional processing deals with one’s ability to keep task-relevant information when distracted. The visuospatial sketchpad temporarily stores visual and spatial information to be manipulated as needed. The episodic buffer integrates short-term and long term memory as it serves as the interface between the two.

Executive function is the overarching term for the management of cognitive processes, including working memory, reasoning, task flexibility, problem solving and planning. As a result, executive function has been found to significantly relate to reading achievement. For example,
Gathercole, et.al, (2000) found that children who were not achieving expected levels on a national curriculum assessment also tested poorly with their working memory functions. The findings indicated that, in particular, a child’s ability to process and store verbal material simultaneously and use of the visuospatial memory (sketchpad) had the biggest correlation with working memory. This temporary memorization and the simultaneous processing that occurs are the key executive functions of the working memory. The WM capacity is limited and as a result there is a constant competition between memorization and the simultaneous processing that occurs during reading and the comprehension tasks that follow. A crucial ability to effectively use the capacity available in the working memory is one’s ability to organize information in a systematic way so it can be accessed at a later point within a single task (Mih, 2011).

**Defining Semantic Memory**

The working memory is a buffer to semantic memory. The semantic memory stores conceptual information learned from words. Most classroom situations relay on semantic memory to recall facts, meanings, concepts and knowledge about the external world. For example, math facts, capital cities, functions of objects and vocabulary definitions are stored in the semantic memory. In order for semantic (meaning) information to be placed in long-term storage, the information must be repeatedly processed. Students of all levels often cram for tests and through this repetitious studying can retain the information in their semantic memory long enough to take and even do well on the test. However, this information never makes it to the long-term memory with this method of learning.

The episodic memory, where we learn new facts or concepts from experiences, ultimately supports the semantic memory. Information transitions from the episodic to semantic memory
where the generalized or factual information from the experience is stored. Semantic memory can easily fail us because it must be stimulated by associations, comparisons and similarities (Sprenger, 1999).

**Phonological Processes and Memory**

The efficiency of phonological processes is an important limiting factor in working memory capacity. As a result, there is a causal link between phonological processes, verbal working memory and lexical access, the process by which basic sound-meaning connections of language are accessed (Brady, 1991). For example, beginning readers often have difficulty understanding long or complex sentences, or might be able to read the text, but don’t understand the meaning because of the working memory’s limited capacity. As reading ability progresses, the meaning of each sentence in a paragraph must be held together in the memory and then connected to subsequent sentences and paragraphs. Along the way, the memory is sorting through which details to remember so by the given section the reader can understand the main idea (Sousa, 2004). Simply stated, if it is a huge effort to recognize words, then comprehension suffers. The more efficient you are at recognizing words and chunking text into phrases the faster you can read and the more you can focus on comprehension! A reader with inefficient word task processing would also struggle to make inferences from text as working memory capacity would be more dedicated to the word task than comprehension monitoring. In essence, too much energy is put into recognizing words at the expense of comprehension.

**Inferencing Comprehension and Working Memory**

As readers mature, they are required to make inferences in order to comprehend text. A reader has to use various cognitive processes, many of which involve one’s working and
semantic memory in order to make these inferences. First, the reader must search for information in her long and short term memory and bring that to the working memory along with information from the text required to make the inference. The information is processed in the working memory, becomes part of semantic memory and is then checked to ensure that the inference made explains and agrees with the previously stored and accessed information (Singer, 1992). The capacity and functionality of the reader’s working memory is crucial in order to process inferential text. By age four, the cognitive structure of the working memory is in place. If the working memory functionality and capacity were assessed at that young age, results could be used to diagnosis potential reading difficulties. For example, a study by Nevo and Breznitz (2011) found that a capacity measure of phonological memory was the best predictor of reading comprehension in kindergarten and 1st grade children as well as the second best predictor decoding. This study supports data measures of working memory combined with other common kindergarten assessments may provide a better prediction of a child’s future success with reading.

There is also some evidence that working memory capacity effects college students’ performance on comprehension measured by standardized assessments (Cain et.al, 2004). Comprehending text requires that a mental or situational model be constructed by the reader. The reader uses integration and inference to construct the model, but often requires relevant information from the text or world to be available and accessible. Generally, inferences follow this construction-integration of text comprehension (Kintsch, 1988). The WM holds the most recently read text and information retrieved from the long-term memory in order to integrate it with the text being actively read. One appreciable factor for making inferences is the background
knowledge available to construct meaning. Background knowledge is stored in the long-term semantic memory, but is combined with the text being read in the working memory in order to comprehend. Knowledge-based inferences that require background knowledge and information from several sources to come together place a bigger burden on WM (Grasser et.al, 1994).

Bridging inferences are crucial for coherence of text as it establishes connections between the current sentence and preceding text. Fiction readers, for example, must be able to mentally link a sequence of events to form a coherent representation of the story. Without these connections, comprehension would be disabled. There is evidence to suggest that differences exist in working memory capacity of skilled and unskilled readers. In particular, working memory capacity and the subsequent semantic memory storage has great impact on the processes involved in making bridging inferences (Singer & Ritchot, 1996).

Consider this example:

She looked up at the basketball hoop. Slowly, she dribbled the ball, dreading the moment when she would have to take the shot.

Within the working and semantic memory, the reader is required to determine who “she” is and her importance to the story, that the story takes place at a basketball game and that “she” is getting ready to shoot the ball and feeling a lot of pressure. In order to comprehend just those two sentences a reader has to make numerous inferences. These ongoing mental computations, and the short storage of the products of those processes occur as part of the processing through working memory into long-term semantic storage (Just & Carpenter, 1992).

Word knowledge is also important in order for a reader to make accurate bridging inferences. This relationship between reading and working memory also lies in the processing
and storage of words and sentences. Skills such as the recall of facts, using context clues and understanding the semantic relation of words in text also rely on working memory functionality and capacity, which in return effects the ability of the reader to make inferences from the text. These tasks require verbal coding, which is the way we put words together and is correlated with reading performance (Cain et.al, 2004). Verbal deficits of the working memory are associated with reading problems; however, more research needs to be done to determine if the memory deficit is a primary or contributing factor to troubled readers (Brady, 1991).

The Brain, Memory and Inferencing Tasks

The relationship between working memory and word tasks has also been analyzed by looking at brain patterns. The functions of the working memory take place in the frontal lobe of the brain. Using functional magnetic resonance imaging (fMRI), researchers found that specific parts of the brain were activated depending on whether the word tasks were phonological (spoken), orthographic (written) or morphological (forms and structures). The brain activated in common and unique patterns depending on the word form. In children specifically, the working memory activated during the exploration of the various word forms indicated constructed relationships between each task. Phonological processing is a higher level task than auditory processing and as a result children with disabilities related to phonological processing have reading and spelling problems. Likewise, children with impairment related to orthographic storage and processing are likely to have reading and writing problems. If an impairment of the morphological storage or processing exists, children are likely to have reading, writing and oral language problems as this word system is part of both spoken and written language (Berninger, et. al, 2010).
A study conducted by Beeman (1993) found in participants with brain damage from impact injuries there was evidence of the role of the right hemisphere language areas of the brain in drawing inferences in order to integrate sentences and comprehend text (Beeman, 1993; Brownell, Potter, Bihrlle, & Gardner, 1986). This is particularly true with bridging inferences (Tomkins & Mateer, 1985). However, with limits in the amount and quality of research completed and imaging results being inconsistent the mapping of the cognitive processes in the right hemisphere are not well defined. Mason and Just (2004) found that whenever inferencing is necessary to maintain coherence in text, the dorsolateral prefrontal cortex is involved. If the inference is drawn successfully then the right-hemisphere language areas play an active role as well (Mason and Just, 2004).

**Inferential Comprehension Strategy**

In order to make inferences from text, the reader must hold information in the working memory in manageable chunks and combine it with the schema or background knowledge stored in the semantic memory. Information from what the text says and what the reader knows needs to be combined in the working memory in order to accurately draw an inferential conclusion from text. On page 65 of *When Kids Can’t Read, What Teachers Can Do*, author Kylene Beers identifies thirteen types of inferences skilled readers make. The following are the most prominent inferences supported through the *It Says, I Say, And So* strategy implemented in this study.

- Use context clues to figure out the meanings of unknown words,
- Recognize character tone,
- Identify the beliefs, personalities, and motivations of characters,
- Understand character relationships,
• Provide explanations for events and ideas in the text,
• Offer details or their own explanations of events in the text,
• Understand the author’s point of view,
• Recognize the author’s bias,
• Relate the text to events in their own lives, and
• Construct conclusions based from the facts in the text.

Methodology

The research cited above suggests that a reader’s ability to make inferences from text relies on the functionality and capacity of the working and semantic memory. During the spring of 2013, I implemented a study with the purpose of evaluating the impact of the working and semantic memory on student’s ability to make inferences from text. I noticed with my grades 3 and 4 English Language Arts (ELA) class that many students struggled to answer inferencing questions about text, especially in multiple choice format. I believed their comprehension was breaking down because students had difficulty organizing new information, combining it with what they already knew and then evaluating and reviewing which answer option was the most appropriate given those two information sources. All of those functions take place in the working memory. The students in this spring 2013 study were targeted with the strategy, It Says, I Say, And So in order to improve inferencing skills related to working and semantic memory capacity and functionality. It says, I Say, and So is an organizational strategy designed to help students make connections between text and themselves and subsequently support inferential comprehension. The following questions guided my research and study:
• How does the capacity and functionality of the working and semantic memory effect one’s ability to inference and therefore comprehend literature?

• Will a strategy designed to improve inferencing comprehension also positively impact working/semantic memory capacity and functionality?

Participants

The participants in this spring 2013 study were twenty-two grade 3 students, 8 female and 14 male, and twelve grade 4 students, 5 female and 7 male. My study took place at a charter school in St. Paul, Minnesota that has about 930 students in grades K-12. I taught my 34 grade three and four students every day from 9:30-10:55 as part of our grades 3-4 differentiated ELA switch. According to MAP (Measurement of Academic Progress) data, miscue analysis and classroom assessments, students in my class averaged approximately at a grade level 2.8. 64.71% of the students in this study were classified as Limited English Proficient (LEP) on their state records.

Assessment Materials

The first section of the pre-assessment and post-assessment consisted of eight short passages at a grade 3 reading level with two to five simple sentences and corresponding multiple choice questions that required the reader to make inferences from the short text. All passages were fiction in nature. The second section of the pre-assessment and post-assessment consisted of four longer passages of six to eleven complex sentences and corresponding multiple choice questions that required the reader to make inferences from the text. Two passages were non-fiction and two fiction at a 4.5 grade level. The pre and post-assessment is listed in Appendix A. This study also included a pre- and post-survey with questions evaluating student’s perception of
their working and short-term memory in daily tasks and with reading fiction and non-fiction text. 

The pre- and post memory perception survey is listed in Appendix B.

The strategy implemented with students, *It Says, I Say, And So*, came from *When Kids Can’t Read, What Teachers Can Do* by Kylene Beers (2003). The modeled, guided and collaborative implementation and practice of the strategy used poetry, non-fiction and fiction text with open response and multiple choice inferencing questions at the grade 3 and 4 reading levels. Students wrote their findings for *It Says, I Say, And So* in text boxes I created on a separate paper from the passages and questions. Students were independently, formatively assessed on their usage of the strategy with a grade 3 and 4 non-fiction text and poem with corresponding multiple choice questions that required the reader to make inferences. I created *It Says, I Say, And So* text boxes on the same page as the questions and the passages on a separate page for the formative assessment of the strategy. The formative assessment for *It Says, I Say, And So* is listed in Appendix C.

**Procedures**

I implemented an inferential comprehension strategy, *It Says, I Say, And So* strategy intermittently for 3 weeks after the pre-test and pre-survey were administered. This strategy required students to identify information in the text (It Says) that were clues for answering the question at hand. Then, students considered their background knowledge or additional inferred information about the question topic (I Say). Finally, students combined information identified from the text and their background knowledge in order to properly answer the question (And So). Parent permission slips for student participation in the study were also collected prior to administering the pre-test.
On the first day of implementation of the *It Says, I Say, And So* strategy, I explained to students that they were going to learn a strategy that would help them answer questions that required them to make inferences from the text. Students were informed that this strategy was part of my graduate research and that I wanted to see if this strategy would help them be better inference makers and help with remembering and organizing the information in their brain (working/semantic memory). I introduced the strategy by modeling it three times with text we had previously read together. For the “It Says” box, I showed students how to read the question and return to the text to find clues to help answer the question. When those clues were located, I underlined and indicated the question number the clue corresponded to. The key words or phrases from the underlined clues were written in the “It Says” box. For the “I Say” box, I showed students how I used information I already knew about the question’s content or what additional personal knowledge I had about the “It Says” clue to write corresponding notes or key words in the “I Say” box. For the “And So” box, I showed students to review the information from “It Says” and “I Say” in order to infer the correct answer for “And So” and to check that the answer made sense considering the other boxes. Then, I led students through guided practice of the strategy.

On the second day of implementation, I reviewed the strategy steps, modeled two more questions and led students through three more questions in guided practice. Students then worked collaboratively in small groups to answer four more questions using the strategy. The same implementation occurred on the third day as well. I reviewed the strategy steps, modeled one question and then led students through three more guided practice questions on the fourth day of implementation. Then, students worked collaboratively in pairs to apply the strategy with four
more questions. On the fifth and part of the sixth day of implementation students worked independently to apply the strategy with four questions from non-fiction text and four questions from a poem.

**Findings and Results**

Questions 3, 4, 7, 13 and 14, on the pre and post memory perception survey were specific to working memory functionality. Questions 7 and 14 related to reading comprehension, while questions 3, 4 and 14 dealt with processing of oral directions. Although questions 3, 4 and 14 involve the working memory, questions 7 and 13 are specific to reading comprehension monitoring in the working memory and as such are of greater importance to this study.

- Question 3: When a teacher gives me ONE direction I remember what to do without having to ask again.
- Question 4: When a teacher gives me TWO or THREE directions at the same time, I remember what to do without having to ask again.
- Question 7: When I read a fiction story I can remember what I read in the sentence before.
- Question 13: When I read a non-fiction passage I can remember what I read in the sentence before.
- Question 14: When my parents ask me to do something I remember what to do without having to ask again.

On the pre-survey, student perception of their working memory functionality in regards to remembering the preceding sentence while reading fiction text was slightly higher than non-fiction text. 8 students indicated they could “always” remember the preceding sentence in fiction text, 12 could “most of the time”, 9 could “sometimes” and 5 could “never” remember.
Comparatively, with remembering the preceding sentence while reading non-fiction text, 8 students could “always” remember, 9 could “most of the time”, 16 could “sometimes” and 1 could “never” remember. Results from the pre-memory perception survey can be found in figure 1.

On the post-survey, student perception of their working memory functionality in regards to remembering the preceding sentence while reading fiction text continued to be slightly higher than non-fiction text. On the post-survey, 10 students indicated they could “always” remember the preceding sentence in fiction text, 11 could “most of the time”, 10 could “sometimes” and 2 could “never” remember. Comparatively, with remembering the preceding sentence while reading non-fiction text, 6 students could “always” remember, 12 could “most of the time”, 11 could “sometimes” and 4 could “never” remember. (Note: 1 student was not present to take the post-survey.) Results from the post-memory perception survey can be found in figure 2.

On the first section of the pre-assessment, students averaged 5.79 questions correct out of 8 or 72.43% correct. On the second section of the pre-assessment, students averaged 2.29 questions correct out of 4, or 57.35% correct. The second section had two fiction and two non-fiction texts and student results varied greatly based on text type. On non-fiction text, student averaged .912 questions correct out of 2, or a% average, while on fiction text, students averaged 1.38 questions correct out of 2, or a 69.12% average.

On the first section of the post-assessment, students averaged 5.79 questions correct out of 8 or 72.35% correct, the same as the pre-assessment (except one student was not present for
the post-assessment). On the second section of the post-assessment, students averaged 2.0 questions correct out of 4, or 50% correct. The second section had two fiction and two non-fiction texts and student results varied greatly based on text genre. On non-fiction text, students’ averaged .66 questions correct out of 2, or a 33.33% average, while on fiction text, students averaged 1.33 questions correct out of 2, or a 66.166% average. Results from the pre and post-assessment can be viewed in figure 3.

[Insert Figure 3 about here.]

The grade 3 and 4 formative assessment (non-fiction and poetry) of the strategy, *It Says, I Say, And So*, student work was analyzed overall and based on question type. Overall, the 28 students who were present to complete the assessment averaged 5.57 questions correct out of 8, or a 69.64% average. The percent correct by question number and type is indicated in table 1. Questions #1-4 are from non-fiction text and questions #5-8 from a fiction poem.

[Insert Table 1 about here.]

**Interpretation and Analysis of Results**

Based on the results of the pre and post assessment, students did not improve on their ability to make inferences from short, simple sentence text and overall digressed in their ability to make inferences from longer, more difficult and complicated text. On the first section, there were two questions in particular that the majority of students got wrong on both the pre and post test, in most responses the “plausible distractor” answer option was chosen. According to the pre and post survey, the class overall perceived themselves as being improved in their ability to remember the preceding sentence read in both fiction and non-fiction text. On the survey
questions relating to working memory in general, students also indicated an improvement in memory function and capacity.

On average, students performed at almost 70% on the formative assessment with box forms provided for the *It Says, I Say, And So* strategy. Two of the poetry questions (#5,6) were the most difficult for the class. After further reviewing these two questions it is noteworthy that the “plausible distractor” answer option was picked by almost all students who got these questions wrong. In the, “It Says” box, students found clues that corresponded to the “plausible distractor”, however these were not the clues that corresponded with the correct answer. The rubric for scoring the *It Says, I Say, And So* formative assessment is found in Appendix D.

After further review of the “It Says” and “I Say” boxes, when students identified clues and corresponding background knowledge or additional inferred questions the answer option chosen was typically correct. Consider, for example these six students who represent two high, two mid and two low performers on the pre-test.

- Student 1: three questions met the expectations for “It Says” and “I Say” and all three were correct; for the other five questions, student partially met the expectations by identifying clues and background information, but those identified did not correspond with the correct answer option but instead the plausible distractors.

- Student 2: two questions met the expectations for “It Says” and “I Say” and both resulted in correct answers; for the other seven questions, student partially met the expectations by identifying clues and background information, but those identified did not correspond with the correct answer option but instead most corresponded to the plausible distractors.
• Student 3: six questions met the expectations for “It Says” and “I Say” and all resulted in correct answers; for the other two questions, student partially met the expectations by identifying clues and background information, but those identified did not correspond with the correct answer option, but instead the plausible distractors.

• Student 4: seven questions met the expectations for “It Says” and “I Say” and all resulted in correct answers; for the other question, student partially met the expectations by identifying clues and background information but those identified did not correspond with the correct answer option, but instead the plausible distractor.

• Student 5: six questions met the expectations for “It Says” and “I Say” and all resulted in correct answers; for the other two questions, student partially met the expectations by identifying clues and background information, but those identified did not correspond with the correct answer option but instead the plausible distractors.

• Student 6: six questions met the expectations for “It Says” and “I Say” and all resulted in correct answers; for the other two questions, student partially met the expectations by identifying clues and background information, but those identified did not correspond with the correct answer option but instead the plausible distractors.

From this sampling of students, data indicates that students are not skilled in identifying the plausible distractor, which in many cases leads to incorrect answers even when using the It Says, I Say, And So strategy. See figure 4 for a graphic representation of these student samples.

[Insert Figure 4 about here.]
Research Limitations

The difficulty with many of the studies around working and semantic memory is the variety of influences that effect the results of the strategies or training implemented. The strategies or training might effect other areas that the research is not evaluating or taking into consideration. That could certainly be the case in this study. For example, the skills required to effectively use the It Says, I Say, And So strategy include:

- properly decoding the text,
- understanding what the questions are asking of the reader,
- properly identifying key words or phrases in the question and paraphrasing them for personal understanding,
- exploring background knowledge (schema) in the long-term memory that will help answer the question,
- combining background knowledge with text clues,
- evaluating the most crucial information needed to answer the question, and
- holding synthesized information in WM in order to choose the correct answer.

Although many of those processes do involve the information be temporarily stored and utilized in the working memory, isolating and assessing the working memory and semantic task elements is difficult and was the biggest challenge of this study.

One of the biggest challenges I had as an action researcher was isolating the working memory for my data collection and analysis. My difficulty came, in part, because of limited sufficient measurement tools at my disposal. An fMRI and other more scientifically designed measurement tools for WM would be more appropriate ways to measure WM capacity and
functionality while a reader made inferences from text. Those tools are not at the disposable of a classroom teacher, but even an assessment such as portions of the Woodcock Johnson, BRIEF (Behavior Rating Inventory of Executive Function), or CTOPP (Comprehensive Tests of Phonological Processing) would provide more scientific evidence than the researcher created assessment and survey used in this study. Furthermore, the pre and post assessment I used could have been constructed differently to better measure inferencing comprehension at student’s instructional reading level.

Other factors may have also affected the students’ performance on the post-assessment. Due simply to the timing of the semester, students were taking Minnesota Comprehension Assessment (MCA) the two days prior to the administration of the post-test. I was disappointed with the results of the post-test and as a result, gathered additional qualitative data from my students after the post-assessment administration. Many students expressed that they were simply tired of taking tests and therefore didn’t put in their best effort. I saw evidence of this as well, as many students simply did not use the It Says, I Say, And So strategy on the post-assessment as they had on the formative assessment and claimed to have used on their MCA Reading.

A personal difficulty I encountered was doing both the research and the study simultaneously. I implemented several other strategies targeting working memory and inferencing prior to focusing on the It Says, I Say, and So strategy. I was researching the topic of working memory and inferencing while hypothesizing as to the best strategy to implement to match those needs and considering the ways to properly measure it. I think my assessment choice and study would have been more effective had I done my research first and then designed the study with that research in mind.
It is also important to note, that there is research on this subject that indicates in some children and adults, working memory impairment does not contribute to reading problems (Brady, 1991). Other conflicting results about the effect of working memory on reading comprehension are indicated by Ericsson and Kintsch (1995), who reinterpreted Cantor and Engle’s (1993) findings to indicate that language processing expertise accounted for the relationship between reading span and language comprehension and not working memory capacity.

**Future Research Implications**

As I extend my research on this topic, my recommendation is to utilize a more scientific measurement tool for the pre- and post-assessment that is specific to working memory functionality and capacity. In refining this study, I would administer the Comprehensive Test of Phonological Processes (CTOPP), specifically the memory of digits and nonword repetition sections, which would provide a norm referenced phonological memory composite score. The phonological memory composite score would represent the child’s ability to code information phonologically for temporary storage in working or short-term memory. This assessment would also provide insight into the functionality of the phonological loop, where the most recent two seconds worth of auditory information is stored. The phonological loop also compromises an articulatory control that provides initial input to the phonological loop that can refresh information already present in order to store it longer than two seconds. The CTOPP would allow me to review performance using percentile rankings while considering the age of the student. I would then be able to compare CTOPP performance relative to phonological memory to student
performance on an inferencing pre and post-assessment. CTOPP materials are located in Appendix E.

I would also refine the student memory perception pre and post survey to provide for a greater focus on working and semantic memory processes. Appendix G contains the refined memory perception survey. The results of the survey could also be compared with CTOPP and the inferencing pre and post assessment results. Refinements to the inferencing pre and post assessment would be relative to the text difficulty (assuring it is appropriate to the instructional level of the students) while providing for a balance of question types relative to the Common Core Standards. Appendix F contains the refined pre and post assessment. In addition to changes and refinements of the assessments, the reading strategy itself will also be revised and extended.

My school supports a comprehensive K-12 school reform model that provides teachers with powerful opportunities for career advancement, ongoing professional development, a fair evaluation system and performance-based compensation. As a member of the program’s leadership team, I will apply what I learned from the research and corresponding methodology discussed in this paper to a longitudinal study our team will conduct with grades 3-5.

In September 2013, our team identified overarching problems with the reading achievement of students in grades 3-5 based on state and local assessment data. Our data showed that student’s were performing below grade level on multiple choice reading assessments (MCA and MAP). In particular, students were struggling to answer inferencing questions correctly, which compose the majority of the question types on the assessments. After further analysis of data, our team determined students need a strategy for multiple choice assessments that will help them identify the type of question and determine whether information to answer the question will
come exclusively from the text, their own schema, or a combination of the two. The well-known *Question Answer Relationship (QAR)* strategy and *It Says, I Say and So* strategy could be merged to meet this identified student need.

Last year our school piloted a problem solving strategy called *STAR* (Search - Think - Answer - Review) and upon evaluation of the task analysis or steps of the *STAR* strategy, our leadership team found that this hybrid of *QAR* and *It Says, I Say and So* could easily be imbedded into the “search” and “think” steps of the *STAR* strategy. The “answer” step of *STAR* would require students to cite their evidence for their chosen answer and then the “review” step would ask students to identify which answer option is the plausible distractor. As a result, the *STAR* strategy would become a comprehensive critical thinking and problem solving strategy, which would support student achievement on standardized multiple choice assessments.

Of course, a strategy of this nature would need to be broken into smaller pieces, field tested with a variety of students, refined and then presented to teachers systematically for implementation in the classroom. Teacher support through coaching as well as providing observational feedback would be crucial for the refined *STAR* strategy to be implemented successfully over time. The field testing plan draft in Appendix H provides an overview of the longitudinal study we are considering.

**Conclusion**

As explored throughout this paper, there is a large body of evidence that working memory efficiency is one of the primary determinants of individual differences among readers (Just & Carpenter, 1992). The effect of working memory begins with phonological processes and as readers mature the working memory maintains its importance in comprehension. Considering the
capacity limitations of working memory, a strategy that provides students a tool to organize information from the text and personal schema should support inferential comprehension. In order to assist comprehension on multiple choice assessments, I concluded an important first step is to identify the type of question and whether the answer will be cited through text, schema, or a combination of the two. When students know where to designate their cognitive processes, it can help manage the load on the capacity limited working memory and its buffer, semantic memory.

The longitudinal literacy plan we are developing at my school is supported by my research and enhanced through high-quality collaboration. As our team moves forward with planning how to best support the reading achievement of our students, I find it a great asset to have a deeper understanding of the effect working and semantic memory have on the ability to read, comprehend text and answer corresponding inferential questions.
References


**Figure 1**

**Pre-Memory Perception Survey Results**

- **Always**
- **Most of the Time**
- **Sometimes**
- **Never**
• Question 3: When a teacher gives me ONE direction I remember what to do without having to ask again.
• Question 4: When a teacher gives me TWO or THREE directions at the same time, I remember what to do without having to ask again.
• Question 7: When I read a fiction story I can remember what I read in the sentence before.
• Question 13: When I read a non-fiction passage I can remember what I read in the sentence before.
• Question 14: When my parents ask me to do something I remember what to do without having to ask again.

Figure 2
Pre and Post Assessment Results Comparison
### Table 1

<table>
<thead>
<tr>
<th>Question Type (Standard)</th>
<th>1 - NF</th>
<th>2 - NF</th>
<th>3 - NF</th>
<th>4 - NF</th>
<th>5 - F</th>
<th>6 - F</th>
<th>7 - F</th>
<th>8 - F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supporting Details</td>
<td>Main Idea (context clues)</td>
<td>Vocabulary</td>
<td>Supporting Details</td>
<td>Author's Craft</td>
<td>Author’s Purpose</td>
<td>Character Trait</td>
<td>Author’s Perspective</td>
</tr>
<tr>
<td>Average % correct</td>
<td>82.35%</td>
<td>61.76%</td>
<td>76.47%</td>
<td>61.76%</td>
<td>38.24%</td>
<td>35.29%</td>
<td>91.12%</td>
<td>70.59%</td>
</tr>
</tbody>
</table>

**Figure 4**

It Says - I Say Formative Assessment - Student Samples

- Blue bars: Questions Met “It Says” and “I Say” expectations and question was answered correctly.
- Green bars: Questions Partially Met “It Says” and “I Say” expectations but identified clues and background information corresponded to the plausible distractor.
Appendix A

Pre & Post Assessment (Spring 2013)

Making Inferences

DIRECTIONS: Read each passage. Examine the text for clues, then, use your personal knowledge and experience to help you choose the most likely inference. Circle the letter next to the best response.

1. Rubin dug frantically through his backpack. It has to be here, he thought. How many times had his mother told him not to take his iPod to school. He searched his locker again without much hope. He knew he was in trouble.
   a. Rubin is looking for his homework.
   b. Rubin is looking for his iPod.
   c. Robin often gets in trouble.
   d. Someone has stolen Rubin’s iPod.

2. “You don’t know what you’re missing,” Jimesha shouted into the phone over the loud music of the party.
   “Nah, I’m too tired,” Amber said.
   “Well, suit yourself, but you’ll be sorry,” Jimesha replied.
   a. Jimesha wants Amber to come out.
   b. Jimesha is coming to Amber’s house.
   c. Amber is sorry she didn’t listen to Jimesha.
   d. Amber hasn’t been sleeping very well.

3. Tre heard footsteps. Someone was following him. The hair on the back of his neck stood on end. He began to quicken his pace, hoping that whoever was behind him wouldn’t notice, but at last he gave in to a run.
   a. Tre is late for an appointment.
   b. Tre is afraid.
   c. Tre is very fast.
   d. Tre is running to the police station.

4. Tyler slammed down the phone. Why did Daniel always have to have things his way? Why didn’t he ever listen?
   a. Tyler regrets speaking so rudely.
   b. Daniel is always right.
   c. Daniel asked if Tyler wanted to come over.
   d. Tyler and Daniel had an argument.

5. By the time Rajah arrived at the restaurant, Andrew was sipping on his third soft drink. “I’m so sorry,” she called out when she saw him, pointing to her bare wrist where her watch had been.
   a. Andrew is patient.
   b. Rajah is late.
   c. Andrew drinks fast.
   d. Rajah wants Andrew to loan her her watch.

6. “I left my gym clothes in mom’s car,” explained Mykayla. The coach shook his head, pointed to the bleachers, and walked away without a word.
   a. Mykayla has forgotten her gym clothes before.
   b. Mykayla hates to dress out for gym.
   c. The coach does not like Mykayla.
   d. The coach is getting Mykayla’s gym clothes.

7. The noisy classroom fell silent as soon as Mrs. Barker stepped through the door. The students shuffled nervously, their eyes darting back and forth from the broom in Gabriel’s hand to the broken light fixture swinging overhead.
   a. Mrs. Barker is about to give the students a test.
   b. Gabriel is cleaning the classroom.
   c. Gabriel broke the light with the broom.
   d. Mrs. Barker is really a witch.

8. Dalton twisted the handlebars from side to side, trying to keep the bicycle upright. His feet pumped the pedals, and as the bike picked up speed he found he could steer it much more easily. “Look, I’m doing it!” he shouted.
   a. Dalton just learned to ride a bike.
   b. Dalton got a job delivering papers.
   c. Dalton just got a new bike.
   d. Dalton is very clumsy.
Directions: Read the selections below and select the best answer to each question that follows, based on the information in the selection.

1. There was once a wolf who became tired of hunting for his food. It was hard work finding animals, and he was not always successful at catching them. Also, there was always the danger of being shot by angry farmers or ranchers.

One day he thought of a plan so that he would not have to work so hard. He decided to wrap himself up in a sheepskin and live in a sheep pen on a farm. Then, when he was hungry, his food would be nearby. All he would have to do is kill one of the nice, fat lambs.

That same night, however, the farmer also decided to have lamb for dinner. It was very dark when he went down to the pen and grabbed and killed the first sheep he found. Imagine his surprise when he saw that he had actually killed a wolf.

What led to the wolf’s death?

A. The wolf was lazy, and he decided to hide in the sheep pen rather than to hunt.
B. The wolf enjoyed life and wanted to travel to all the farms.
C. The wolf liked sheep so much that he wanted to live with them.
D. The wolf thought that other people could do his work for him.

2. Air pollution is a serious problem. It is caused by the exhaust from cars, SUV’s and trucks, as well as the smoke from factories and fireplaces. Many scientists say pollution is changing our climate. Our climate is getting warmer. Also, we know that air pollution causes or aggravates illnesses such as asthma or emphysema.

If air pollution is not stopped, with what will we probably have more problems?

A. There will not be enough cars, SUV’s, and trucks.
B. People will continue to burn wood in fireplaces.
C. There will be more cases of lung diseases and the climate will change more.
D. There will not be enough highways for more cars, SUV’s, and trucks.
3. Gabriela and Elena are best friends. They are in the same grade, have the same birthday, and do the same before-school job together, delivering newspapers. As they fold the newspapers for delivery, they like to read the headlines.

One day Gabriela noticed a headline about a huge fire across town in a row of apartment buildings that had been under construction. The buildings had been standing half-built for several months. Elena wondered why construction had stopped. Gabriela was determined to find out what happened. After talking to people in the neighborhood and looking at records in City Hall, she learned that the apartment area’s zoning changed to a business zone and that a stadium would be built there. She found out that police were already investigating the owner of the property for possibly burning down the building to get insurance money.

How did Gabriela handle the news story?

A. She ignored the news story and did nothing.
B. She investigated the news story like a detective would.
C. She forgot about the news story.
D. She went to the police to tell them the story.

4. The Titanic was the largest ship in the world in 1912. She was two blocks long and eleven stories high. She was also supposed to be the safest ship afloat.

On April 10, 1912, the Titanic began her first voyage from England to New York, with 2,200 men, women, and children aboard. Two days later, it was traveling at full speed through the North Atlantic. All was well, except that the telegraph operator began to get messages about icebergs ahead. The ship’s captain read some of the messages, but did not think the messages were very important. He simply asked the men on lookout to watch for icebergs.

Just before midnight, a man on lookout saw a large white shape ahead of the ship. It was too late to turn the ship away from the iceberg. It hit the iceberg hard and water started to fill the ship. Lifeboats were lowered with women and children, but more than 1,500 people died when the ship sank into the cold North Atlantic.

Based on this selection, what do you think was the most important reason for the sinking of the Titanic?

A. The Titanic was two blocks long and eleven stories high.
B. The ship’s captain ignored the importance of the messages about the icebergs ahead.
C. The Titanic sank with more than 1,500 people aboard.
D. The ship was built to be the safest in the world.
Appendix B

Pre & Post Memory Perception Survey (Spring 2013)

1. When my teacher gives me directions I remember what to do.
   Always          Sometimes          Never

2. When I learn a new word in reading class, I think about how it connects to something I already know.
   Always          Sometimes          Never

3. I remember what I had for breakfast this morning.
   Always          Sometimes          Never

4. When my parents give me directions I remember what to do.
   Always          Sometimes          Never

5. I can concentrate on what my friends are saying on the bus even when other people around me are talking.
   Always          Sometimes          Never

6. When I learn a new word in Hmong, I think about how it connects to something I already know.
   Always          Sometimes          Never

7. When I write things down it helps me remember it better than just hearing it.
   Always          Sometimes          Never
8. When I read a paragraph from a non-fiction book or magazine I can remember what it was about.

   Always   Sometimes   Never

9. When I read a paragraph from a fiction book I can remember what it was about.

   Always   Sometimes   Never

10. When I read a page from a non-fiction book or magazine I can remember what it was about.

    Always   Sometimes   Never

11. When I read a page from a fiction book I can remember what it was about.

    Always   Sometimes   Never

12. When a teacher asks me a question I can remember what she said.

    Always   Sometimes   Never

13. It is easy for me to follow directions in class.

    Always   Sometimes   Never


    Always   Sometimes   Never

15. I lose my place when I’m reading.

    Always   Sometimes   Never

16. When I’m answering questions on a reading test, I forget what the question was.

    Always   Sometimes   Never
Appendix C

It Says, I Say, And So - Formative Assessment (Spring 2013)

Am I Nuts?

1  “Pass the nuts, please,” I would say when I wanted some peanuts. I didn’t know that peanuts are not nuts! Did you? A nut is a hard, dry fruit that grows on trees. Peanuts do not grow on trees. They are the seeds of a peanut plant and they grow underground.

2  The seed, or peanut, is planted in a field. A small plant pops up quickly and then the plant grows yellow flowers. Like a pumpkin or tomato plant, the bloom will turn into a pod and then a peanut. But the peanut is different because the bloom doesn’t become a peanut above the ground. Instead of growing towards the sun, it grows toward the earth. It pushes through the soil and the peanut grows underground.

3  When peanut plants are harvested, the peanut seed is inside a shell. Sometimes peanuts are roasted in their shells and sold to us so that we can crack the shells and take the peanuts out. Sometimes they are taken out of their shells and salted or covered in honey.

4  You’re not nuts if you thought a peanut was a nut, but now you know that it is a seed. “Pass the seeds, please!”

Interesting Facts about Peanuts

• March is National Peanut Month.
• The peanut plant originated in South America.
• It takes five months for a peanut to fully grow.
• Astronaut Alan B. Shepard brought a peanut with him to the moon.
• The average peanut farm is 100 acres, about the size of 90 football fields.
• Two peanut farmers have been elected president of the USA—Thomas Jefferson and Jimmy Carter.
• The world’s largest peanut was four inches long and grown by a farmer in North Carolina.
• It takes about 540 peanuts to make a 12-ounce jar of peanut butter.

1. Read the sentence from the passage.

You’re not nuts if you thought a peanut was a nut . . .

What do you think this sentence is telling you?
A) Many people think that a peanut is a nut.
B) Many people grow peanuts.
C) Many people like to eat peanuts.
D) Many people roast peanuts.

<table>
<thead>
<tr>
<th>It Says</th>
<th>I Say</th>
<th>And So</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Circle your answer – A, B, C, OR D</td>
</tr>
</tbody>
</table>

2. What is this article MOSTLY about?
A) where nuts are grown
B) what makes a peanut a seed
C) how people like to eat peanuts
D) why it is important to roast peanuts

<table>
<thead>
<tr>
<th>It Says</th>
<th>I Say</th>
<th>And So</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Circle your answer – A, B, C, OR D</td>
</tr>
</tbody>
</table>

3. Read the sentence from the passage.
Sometimes peanuts are roasted in their shells and sold to us so that we can crack the shells and take the peanuts out.

What does the word roasted mean in this sentence?
A) hidden
B) cooked
C) grown
D) bought

<table>
<thead>
<tr>
<th>It Says</th>
<th>I Say</th>
<th>And So</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Circle your answer – A, B, C, OR D</td>
</tr>
</tbody>
</table>

4. What happens right after a peanut plant starts to grow?
A) A seed is planted.
B) Yellow flowers grow on the plant.
C) The plant is harvested.
D) The bloom on the plant turns into a pod.

<table>
<thead>
<tr>
<th>It Says</th>
<th>I Say</th>
<th>And So</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Circle your answer – A, B, C, OR D</td>
</tr>
</tbody>
</table>
Little Bony Sea Horse

Little bony sea horse,
Hiding in the sea,
Won’t you show your colors?
And come out and play with me.

Little bony sea horse,
Swimming all around,
Slipping through the meadow,
Won’t you please calm down?

Little bony sea horse,
10 Searching for some food,
Sucking through your snout,
Please don’t be so rude!

Little bony sea horse,
Flapping fins and tail,
15 Why aren’t you stopping?
Why are you so pale?

Little bony sea horse,
Why did you swim away?
No one’s here but me,
20 And a little blue stingray!

1. Which does the speaker do throughout the poem?
A) answers the sea horse
B) questions the sea horse
C) describes the colors of the sea horse
D) compares the stingray to the sea horse

2. Why did the poet MOST LIKELY write “Little Bony Sea Horse”?
A) to persuade readers to learn more about sea horses
B) to entertain readers with a poem about sea horses
C) to help readers understand how sea horses act
D) to inform readers about where sea horses live

<table>
<thead>
<tr>
<th>It Says</th>
<th>I Say</th>
<th>And So</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Circle your answer – A, B, C, OR D</td>
</tr>
</tbody>
</table>

3. How does the sea horse MOST LIKELY feel?
A) bored
B) happy
C) lazy
D) scared

<table>
<thead>
<tr>
<th>It Says</th>
<th>I Say</th>
<th>And So</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Circle your answer – A, B, C, OR D</td>
</tr>
</tbody>
</table>

4. What does the speaker of the poem try to do?
A) help the sea horse hide
B) tell the sea horse to swim
C) persuade the sea horse to play
D) show the stingray to the sea horse

<table>
<thead>
<tr>
<th>It Says</th>
<th>I Say</th>
<th>And So</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Circle your answer – A, B, C, OR D</td>
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</table>
### Appendix D

*It Says, I Say, And So* - Formative Assessment Rubric (Spring 2013)

<table>
<thead>
<tr>
<th></th>
<th>Does Not Meet</th>
<th>Partially Meets</th>
<th>Meets</th>
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</thead>
<tbody>
<tr>
<td><strong>It Says</strong></td>
<td>Did not identify any clues in the text.</td>
<td>Identified clues that do not correspond to the question.</td>
<td>Identified corresponding clues in the text for each question and underlines them in the text</td>
</tr>
<tr>
<td><strong>I Say</strong></td>
<td>Background knowledge or additional inferred information from the text does not connect to question or “It Says”</td>
<td>Background knowledge or additional inferred information from the text somewhat connects to question or “It Says” clues</td>
<td>Background knowledge or additional inferred information from the text connects to question or “It Says” clues</td>
</tr>
<tr>
<td><strong>And So</strong></td>
<td>Inferred incorrect answer</td>
<td></td>
<td>Inferred correct answer</td>
</tr>
</tbody>
</table>

Text Type (F/NF): ______________________

Question Type:

- Main Idea
- Supporting Details
- Context Clues
- Author’s Message/Perspective/Purpose
- Character
Appendix E

Comprehensive Tests of Phonological Processes (CTOPP)

Subtest III. Memory for Digits

MATERIALS: CD player and Track 6 of CD ("Memory for Digits")

CEILING: Stop after examinee misses 3 test trials in a row.

FEEDBACK: If the examinee makes an error, supply the correct answer only on the practice items.

NOTE: Record the examinee’s complete response to the right of the item on the response sheet. If the examinee wants a trial repeated, say you are not allowed to repeat the numbers.

SCORING: Score 1 point for each test trial completed without error.

DIRECTIONS: Say, "On this one, you will hear some numbers, one after another on the CD player. After you hear the numbers, I want you to say them in the same order that you heard them. Listen carefully because I can’t repeat the numbers. Let’s try a couple for practice." Play the CD, pausing after each trial to allow the examinee to respond. (Note: Try to keep your finger on or near the pause button, so that hand movement does not result in anticipation of end of trial.) Do the practice series. If the examinee makes an error on the practice series, supply the correct answer.

PRACTICE ITEMS: a. 5 2
b. 7 3
c. 9 7 1
d. 6 1 5 Stop Feedback

TEST ITEMS: Say, "Okay, now let’s do some more. Just listen carefully, and do your best."

<table>
<thead>
<tr>
<th>Score (1/0)</th>
<th>Response</th>
<th>Score (1/0)</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ____ 16</td>
<td>________</td>
<td>12. ____ 92483</td>
<td>________</td>
</tr>
<tr>
<td>2. ____ 72</td>
<td>________</td>
<td>13. ____ 849713</td>
<td>________</td>
</tr>
<tr>
<td>3. ____ 94</td>
<td>________</td>
<td>14. ____ 641397</td>
<td>________</td>
</tr>
<tr>
<td>4. ____ 521</td>
<td>________</td>
<td>15. ____ 438975</td>
<td>________</td>
</tr>
<tr>
<td>5. ____ 648</td>
<td>________</td>
<td>16. ____ 3197426</td>
<td>________</td>
</tr>
<tr>
<td>6. ____ 836</td>
<td>________</td>
<td>17. ____ 9251638</td>
<td>________</td>
</tr>
<tr>
<td>7. ____ 5318</td>
<td>________</td>
<td>18. ____ 7145283</td>
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</tr>
<tr>
<td>8. ____ 3741</td>
<td>________</td>
<td>19. ____ 46359271</td>
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</tr>
<tr>
<td>9. ____ 7596</td>
<td>________</td>
<td>20. ____ 97412536</td>
<td>________</td>
</tr>
<tr>
<td>10. ____ 41839</td>
<td>________</td>
<td>21. ____ 49673165</td>
<td>________</td>
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<tr>
<td>11. ____ 63258</td>
<td>________</td>
<td>Total Raw Score</td>
<td>________</td>
</tr>
</tbody>
</table>
EFFECT OF MEMORY ON COMPREHENSION

Subtest V. Nonword Repetition

MATERIALS: CD player and Track 7 of CD (“Nonword Repetition”)

CEILING: Stop after examinee misses 3 test items in a row.

FEEDBACK: Give feedback on all practice items and the first 3 test items.

NOTE: If examinee asks to have an item repeated, say, “I can only play the recorded sounds once.”

SCORING: Record correct answers as 1 and incorrect answers as 0. The total raw score for this subtest is the total number of correct test items up to the ceiling.

DIRECTIONS

PRACTICE ITEMS: Say, “I want you to listen to some made-up words on the CD player. After you hear each made-up word, want you to say it exactly as you heard it and as clearly as you can. Even if it’s hard to say, give it your best try. Listen carefully because I can’t repeat the words. Okay? Let’s try some.” Start CD.

   If correct say, “That’s right. Now try the next word.”
   If incorrect say, “That’s not quite right. The word was _____. Let’s try another word.”
   a. ral (nǔ)
   b. sort (sǎrt)
   c. ballop (bǔl-ñp)

TEST ITEMS: Say, “Let’s try a few more. Listen to the made-up word. Then say it exactly as you hear it. Ready?” FEEDBACK on items 1–3 only:

   If correct say, “That’s right.”
   If incorrect say, “Good try. The word was _____.

<table>
<thead>
<tr>
<th>TEST ITEMS</th>
<th>Score (1/0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. jup (jūp)</td>
<td>——</td>
</tr>
<tr>
<td>2. zld (zld)</td>
<td>——</td>
</tr>
<tr>
<td>3. pate (pāt)</td>
<td>——</td>
</tr>
<tr>
<td>4. meb (mēb)</td>
<td>——</td>
</tr>
<tr>
<td>5. wudolp (wūdolp)</td>
<td>——</td>
</tr>
<tr>
<td>6. nigong (nǐ-gōng)</td>
<td>——</td>
</tr>
<tr>
<td>7. chaswedool (chā-sē-dū’l-tié)</td>
<td>——</td>
</tr>
<tr>
<td>8. bieleeedge (bī-tē-dū)</td>
<td>——</td>
</tr>
<tr>
<td>9. foesutoov (vō’sū-tōv)</td>
<td>——</td>
</tr>
<tr>
<td>10. lisashrut (lī-sā-shūt)</td>
<td>——</td>
</tr>
<tr>
<td>11. wulanuwp (wūl-án-wūp)</td>
<td>——</td>
</tr>
<tr>
<td>12. teebudiehakt (tē-bū’d-ik-t)</td>
<td>——</td>
</tr>
<tr>
<td>13. viverscomou (vī-vē-sō’mō)</td>
<td>——</td>
</tr>
<tr>
<td>14. burloogugendapio (būl-ōgū-gō’-jān-dū-plō)</td>
<td>——</td>
</tr>
<tr>
<td>15. geklezesekad (gēk’-ē-tē-kād)</td>
<td>——</td>
</tr>
<tr>
<td>16. mawgeesbooshoomshlek (mōg’-ē-būg-śē-rōkō-nō’-śik)</td>
<td>——</td>
</tr>
<tr>
<td>17. dookershypatlezaowm (dōk’sē-hū-tē-hā’-pā-tō-zōm)</td>
<td>——</td>
</tr>
<tr>
<td>18. shaburshuolmuw (shā-būr-tū-hūm-vōl-māsh)</td>
<td>——</td>
</tr>
</tbody>
</table>

Total Raw Score ——
els are discrepant from their IQs and for individuals whose poor reading levels are consistent with their IQs.

Of the three kinds of phonological processing measured by the CTOPP, phonological awareness appears to be the most responsive to interventions. For individuals with a deficit in phonological awareness who are at or below the initial stage of reading acquisition, intervention designed to promote phonological awareness may prove fruitful. For individuals with a deficit in phonological awareness who are beyond the initial stage of reading acquisition, a more productive way to enhance phonological awareness is likely to be in the context of a reading program that is structured and systematic, and that explicitly points out connections between spoken and written language (e.g., letter-sound correspondences, blending skills).

**Phonological Memory Composite Score**

The Phonological Memory Composite Score (PMCS) comprises the standard scores of two subtests—Memory for Digits and Nonword Repetition—for all individuals. The PMCS represents the examinee’s ability to code information phonologically for temporary storage in working or short-term memory. Specifically, the PMCS provides an assessment of the functioning of the part of memory called the phonological loop, which provides a brief, verbatim storage of auditory information. The phonological loop itself comprises (a) a phonological store that records the most recent 2 seconds worth of auditory information and (b) an articulatory control process that provides input to the phonological loop initially and also can refresh information already in the loop so that it can be stored for longer than 2 seconds.

A deficit does not inevitably lead to poor reading of familiar material but is more likely to impair decoding of new words, particularly words that are long enough to decode bit by bit, as a means of storing intermediate sounds. A deficit in phonological memory may not impair listening or reading comprehension for simple sentences but is likely to impair both listening and reading comprehension for more complex sentences.

**Rapid Naming Composite Score**

The Rapid Naming Composite Score (RNCS) comprises the standard scores of two subtests—Rapid Color Naming and Rapid Object Naming—for 5- and 6-year-olds and two different subtests—Rapid Digit Naming and Rapid Letter Naming—for 7- through 24-year-olds. The abilities measured by the RNCS include efficient retrieval of phonological information from long-term or permanent memory and executing a sequence of operations quickly and repeatedly. Efficient retrieval of phonological information and execution of sequences of operations are required when readers attempt to
Appendix F

Inferencing Pre and Post Assessment (Revised, 2013-14)

Name: _________________________    Date: _________________

Directions: Read each passage. Examine the text for clues, then use your personal knowledge and experience to help you choose the most likely inference. Circle the letter next to the best response.

1. Chou heard footsteps. Someone was following him. The hair on the back of his neck stood up. He began to quicken his pace, hoping that whoever was behind him wouldn’t notice, but at last he gave in to a run.
   a. Chou enjoys running.
   b. Chou is afraid.
   c. Chou is late to school.
   d. Chou feels excited.

2. Soua dug through her backpack. It has to be here, she thought. How many times had her mother told her not to take her ipad to school. She searched her backpack again. Soua checked her locker without much hope. She knew she was in trouble.
   a. Soua is looking for her homework.
   b. Soua often gets in trouble.
   c. Soua thinks someone took her ipod.
   d. Soua thinks she lost her ipod.

3. The noisy classroom went quiet when Ms. Schulz came through the door. The students went quiet and seemed nervous. Their eyes looked back and forth between Felix who was holding a long ruler and the broken light above him.
   a. Felix broke the light with a long ruler.
   b. Felix is getting ready to take a math test.
   c. Ms. Schulz is a mean teacher.
   d. Ms. Schulz broke the light with a long ruler.

4. “I left my soccer shoes in my mom’s car,” explained Melanie. The coach shook his head, pointed to the bleachers and walked away without saying a word.
a. The coach does not like Melanie.
b. The coach is going to get Melanie’s shoes.
c. The coach is disappointed in Melanie.
d. Melanie did not want to play soccer.

5. “You don’t know what you are missing,” Chimua shouted into the phone over the loud music of the party. “No thanks, I’m too tired,” Eric said. “Okay, but you will be sorry,” Chimua replied.

a. Chimua wants Eric to come to the party.
b. Eric wants to go to the party.
c. Eric stayed up late last night.
d. Chimua is going to Eric’s house.

Directions: Madan is well-known for his sewing. Read this story to find out if he can make a dress that would fit the moon. Use clues from the story and what you know to circle the best answer.

A Dress for the Moon
by Indira Krishnan

Once upon a time a young man named Madan lived in a village in northern India. Madan’s father wanted him to become a farmer. But Madan wished to leave the village and find work in the town of Bari. He promised his father that he would send a part of his earnings home regularly. His father wished him a safe trip.

In the town of Bari, Madan learned to be a tailor. He worked hard and soon became known for the fine clothes he made. The entire town wanted clothes sewed by Madan. The more his fame spread, the more proud and boastful Madan became.

One night Madan sat gazing at the full moon that shone from behind a tall coconut tree. He said, “I am sure I can make a dress for the moon. The moon will praise my handiwork, and then my fame will spread to the sun and stars.” A breeze carried his words to the coconut tree. Laughing softly, the tree bent down and whispered, “That’s one thing you can’t do.” Madan frowned. “How do you know what I can do?” he said. “You are only a tree.”

The coconut tree tried to say something more, but Madan would not listen. “If you want to be of some use, tell the moon that I want to make a dress for her. You are tall enough to do that,” he said.
So the tree told the moon about Madan. The moon agreed to have a dress made by the famous tailor from Earth. Madan jumped for joy. Quickly he began to sew a dress of smooth white satin for the moon. When it was done, he called out to the coconut tree, “You must give this dress to the moon, as I cannot reach her.” The coconut tree agreed.

The following evening, as Madan waited eagerly for the moon to appear, the coconut tree bent down and whispered, “The moon says your dress doesn’t fit. It’s too loose.”

Madan was stunned. “It can’t be!” he cried. “The clothes I make always fit perfectly.” But the moon returned the dress to him, and he had to redo it. He spent the night making the dress a little smaller and gave it back to the tree.

The next evening the moon rose a little later. Madan waited impatiently. But again the coconut tree bent down and whispered, “The dress is still too loose.”

Madan nearly wept with disappointment. “I can’t believe it! How could I go wrong?” he wailed. “I tried to tell you before,” said the tree. “After the moon is full, she grows smaller each day until you can’t see her at all. I have been noticing this for many years. So how can you make one dress that would fit the moon properly? But you wouldn’t listen to me.”

Brokenhearted, Madan sat with his head in his hands and cried the whole night. At the break of day he saw the moon on the other side of the sky. He whispered, “I am sorry, dear Moon. I am not as great a tailor as I thought.” “It’s all right,” said the moon. “After all, I’m the moon. How can I wear clothes as people do?”

From that day on, Madan resolved to work harder than before. He was not vain anymore, and his hard work brought him more money. He remembered to send a good part of his money to his father. People liked him better because he was an excellent tailor and a humble one, too.

1. Where did Madan live once he left his father’s home?
   a. a village in northern India
   b. a village in China
   c. the town of Moon
   d. the town of Bari

2. A person with a job as a tailor
   a. Climbs trees.
   b. Sews clothes.
   c. Studies the moon.
   d. Farms.
3. This story is mostly about
   a. a man who wants to be a farmer but his dad makes him learn to make clothes.
   b. the moon wanting someone to make it a pretty dress to wear every night.
   c. a coconut tree that tries to help a man make a dress for the moon.
   d. a man who learns that he shouldn’t think he is the best at everything.

4. Which sentence best describes Madan at the beginning of the story?
   a. He is quiet and doesn’t care if people wear his clothes.
   b. He is sad and tried to learn more about sewing.
   c. He is kind and generous to others.
   d. He is proud and wants people to know he makes wonderful clothes.

5. Why does Madan want to make a dress for the moon?
   a. He wants the moon to praise his clothes so he will be more famous.
   b. He thinks the moon will be his friend.
   c. He thinks the moon will look prettier in a dress.
   d. He wants to impress his father and get more money.

6. Paragraph 4 stated: The coconut tree tried to say something more, but Madan would not listen.
   This sentence shows that Madan’s character is acting:
   a. Angry.
   b. Deaf.
   c. Stubborn.
   d. Excited.

7. The coconut tree thinks Madan’s idea to make a dress for the moon is
   a. Silly.
   b. Mean.
   c. Smart.
   d. Strange.
8. After the moon returned the dress the second time and said it didn’t fit, Madan
   a. Asked for help.
   b. Cried all night.
   c. Got mad.
   d. Quit sewing.

9. The author probably wrote this story to
   a. tell people why the moon is white and appears every day.
   b. tell people to work hard and not think you are better than others.
   c. make people feel entertained by a funny story.
   d. to make people feel upset because the tailor was mean to the tree.

10. What fact did the author want people to learn about the moon by reading this story?
    a. The moon rises in the evening.
    b. The moon shines on coconut trees.
    c. The moon changes its shape all of the time.
    d. The moon appears in the sky at different times.

11. This story begins with the phrase, “once upon a time”. This phrase tells the reader:
    a. That the story happened in the past.
    b. That the story happens in the present.
    c. That the story is going to be long.
    d. That the story happens in the future.

Appendix G

Pre and Post Semantic and Working Memory Perception Survey (Revised, 2013-14)

1. When my teacher gives me directions I remember what to do.
2. When I learn a new word in reading class, I think about how it connects to something I already know.

Always  Sometimes  Never

3. I remember what I had for breakfast this morning.

Always  Sometimes  Never

4. When my parents give me directions I remember what to do.

Always  Sometimes  Never

5. I can concentrate on what my friends are saying on the bus even when other people around me are talking.

Always  Sometimes  Never

6. When I learn a new word in Hmong, I think about how it connects to something I already know.

Always  Sometimes  Never

7. When I write things down it helps me remember it better than just hearing it.

Always  Sometimes  Never

8. When I read a paragraph from a non-fiction book or magazine I can remember what it was about.

Always  Sometimes  Never

9. When I read a paragraph from a fiction book I can remember what it was about.
10. When I read a page from a non-fiction book or magazine I can remember what it was about.

Always  Sometimes  Never

11. When I read a page from a fiction book or I can remember what it was about.

Always  Sometimes  Never

12. When a teacher asks me a question I can remember what she said.

Always  Sometimes  Never

13. It is easy for me to follow directions in class.

Always  Sometimes  Never

14. My mind wanders when taking a reading test.

Always  Sometimes  Never

15. I lose my place when I’m reading.

Always  Sometimes  Never

16. When I’m answering questions on a reading test, I forget what the question was.

Always  Sometimes  Never
Appendix H

Field Testing Plan Draft, 2013-14

The Problem

- According to MCA and MAP results, student’s are below the state and national norms in reading comprehension, specifically inferential comprehension.
  - Aligns to school goals
  - Will align to cluster cycle goals

Pre-Assessment Data

Note: Data tables removed for confidentiality purposes

Picture Assessment (K-5):

- 97% of students know WHO
- 37% of students know WHERE
- 89% of students know WHEN
- 72% of students responses related entirely to the picture (meets); “What is happening in the picture?”
  - 36% used background knowledge examples in their response
  - 40% provided answers that did not use any background knowledge
  - Answers were “because they are cleaning” or describing what type of cleaning the bears were doing.

Passage Assessment (3-5):

- WHEN: 75% correct; 23% met in explaining why they choose their answer
- WHY: 84% correct; 35% met in explaining why they choose their answer
- HOW: 54% correct; 17% met in explaining why they choose their answer

Pre-Assessment Data Conclusions
Incorrect responses to “where” was primarily “other” – no qualitative data available

Students do not automatically connect their understanding to their background knowledge or schema (picture); this process is not explicit for students.

HOW question (passage) was more challenging, this might relate to the need for student’s to evaluate the text (more like inferencing).

Students struggle to provide reasoning for why they chose the answer they did with explicit questions from a passage. An increased focus on analyzing and citing text clues would be valuable.

Students aren’t aware of their own metacognition

The pre-assessment did not evaluate passage inferencing comprehension; this will need to be an increased focus of field testing now that we know the majority of students are answering explicit questions correctly (although unable to cite why they chose the answer).

Purpose of Field Testing

• Identify if and how the strategy works with your students
• Collect student feedback, work samples, and data used to adjust instruction and monitor student progress
• Identify and isolate the instructional elements and techniques that must be included for student success (Critical Attributes)
• Determine modifications and accommodations for various students
• Prepare to teach cluster members how to implement the strategy effectively to achieve the same or better results

Field Testing Question

What skills do students need in order to apply the STAR (imbedded w/ QAR & It Says, I Say and So) strategy effectively to increase academic (reading/math) comprehension?

  o Aligns to school goal
  o Cluster cycle goal (3rd)

Field Testing Plan
WHO?

- 5th grade, three groups: mid-high, level 3,4 EL and low, SPED, EL
- 3-4th grade, 4 groups: F&P Level N-O, Q+, H-I; D-G; SPED, EL 2-4
- Not filed testing = scripting for all field testers to help determine critical attributes
  - ALL: balance of male/female; variety of EL levels and reading proficiency levels
  - Small groups, 4-6 is adequate
  - ~30 min./lesson - drafts of lessons broken up over several days (I DO, WE DO and WE DO, YOU DO). Allow time for application!

HOW?

- Increase teacher buy-in by tracking H-M-L students performance during field testing with pre-mid-post assessments. Share that information in cluster (visual) and have teachers track the same information with their students. This will also connect back to each student level of the school-wide goals.
- Use provided lesson plan built from task-analysis
- Collect data throughout the process, better to have more than not enough! – formative, summative, anecdotal/observational
- As you field test, think about the following and be prepared to discuss in future eTLT:
  - What actions did I take as a teacher?
  - What was my objective for the lesson?
  - What instructional decisions did I plan ahead of time?
  - What instructional decisions did I make during the lesson, why?
  - What were the outcomes of my actions?
  - How did I formatively assess student progress?
  - How did I monitor the progression of student performance?
  - Was my instruction effective? How do I know?
  - Is there anything I would refine or add to the task analysis?
SEARCH AND THINK has QAR embedded in it. STAR was our starting point, but we knew we needed to breakdown the strategy into smaller chunks, beginning with just a focus on QAR. Through field testing we will determine how to chunk QAR for our students (and teachers) in order to meet our goals.

SEARCH: "I see"
1. Read or listen to question. What do you see?
2. Reread or re-listen to question and notice key words. What words do I already know/understand?
3. Identify (highlight) key question words (relevant)
   • action verbs
   • W- words
   • Math #’s and Vocab
4. Is there any information I don’t need?

THINK:
1. Think about what the question is asking – what do they want to know or find out?
2. What do I have in my "schema" that can help me answer this question. What do I already know about the question?
3. The question is asking me to…
4. Where do I need to look for this answer? My brain? The picture? The words?
5. What information is given? Write down the facts
   • Words
   • Numbers
   • Pictures
6. What should I do with that information?
7. What strategy do I know that will help me answer this question? Can I ask the question in a different way?

ANSWER:
1. Where does the answer go?
2. Cross out an answers that I know aren’t right (multiple choice)
3. Say/Write/Draw the answer. Answer the question using information I have been given
4. What strategy do I know that will help me answer this question? Use what was previously learned…
   • Rules
   • Words
   • Vocabulary
   • Strategies (i.e. step-by-step)
5. Did I provide proof for my answer (text –background knowledge citation)?
6. Do I need to add anything to my answer? Do I have my number of units? Does my answer have a capital letter in the beginning and punctuation at the end.
7. Re-read answer to make sure it is complete.
8. Can I explain how I solved the problem?

REVIEW:
1. Re-read the question
2. Re-read my answer
3. Check my answer - Do math again, go back and re-read text, etc.
4. Re-read question and make sure all parts were answered. Does my answer make sense?
5. What is the plausible distracter (multiple choice)?
6. How do I know? - Did I "count, use my fingers, use a number line or think about the question type, where to get my answer (text/background)"
7. What do I see that supports my answer?
8. I know the answer is.... Because...
9. If my answer doesn’t make sense, I will go back to SEARCH

QAR Task Analysis
1. Introduce QAR, identify need for strategy (set purpose)
2. Categorize in the book vs in the head
3. Categorize both in my head types
4. Generate both in my head types
    ] Formative assessment – students identify whether question is text & me or on my own
5. Categorize both in the book types
6. Generate both in the book types
    ] Formative assessment – students identify whether question is right there or think & search
7. From there, we move on to ANSWER, which we will review more in-depth later (see draft lessons in FT plan).

Field Testing Lesson Plan: Introduction and Pre-Assessment

MATERIALS:

- Pre-Assessment for field testing
- QAR poster
LESSON OVERVIEW: Provide students with an introduction of who you are and a quick warm up to get to know each other. Explain the objective & purpose of your upcoming lessons and administer the pre-assessment.

OBJECTIVE: “We will be working together to learn a strategy called QAR (show poster) This strategy will help you with your reading comprehension (problem solving) and help you answer questions you see on tests (MCA/MAP). It is also a strategy you can use with any subject and with solving problems or answering questions.

GOAL: introduce QAR with a relevant example and explain the importance of the strategy. Focus on the strategy, not the content. Make sure students are aware of the purpose of the strategy and inform them why they are doing it.

Field Testing Lesson Plan: THINK – ELA (QAR, Lesson 1)

MATERIALS:
- ~10-12 questions (explicit and inferential – in the head and in the book) that are cut out separately
- Highlighters/pencils
- QAR anchor chart(in the head vs. in the book)
  o T-chart where students can categorize the questions (in the head vs. in the book)
- Worksheet – students identify in-my-head or in-the-book questions

HOOK: “Let’s think about all of the times we are asked questions. When are you asked questions? How do you know how to answer the questions?” Brainstorm with student questions from parents, friends, teachers, etc. and how we answer those questions using what we already know, what other/text tell us (clues).

OBJECTIVE: “Today we are going to learn about the different types of questions we might be asked after we have read a passage and searched for key clue words. The questions are either In-the-book or In-my-head.”

I DO: “When I am going to answer questions about what I’ve read, I think about whether the question is going to be answered In-the-Book or In-my-head. Clues words from the question can help me figure out whether I’ll need the book or just my head (what I know) to answer the question. First, I’ll SEARCH for the clue words in the question that will help me.
“I’m going to SEARCH through the first question to see if I can find words that might be important clues for me to answer this question. Watch me as I search for clues. I see… I know the word __ is important (or not important) to help me answer the question because… I don’t know this word __, but it might be important because…I think the word ___ is a clue because…”

“I know this question is (in the head or in the book) because (refer to clue SEARCH words) ____.”

Think-aloud at least one In-the-book and one In-the-head question and how the search words helped you know which it was. Categorize the questions on the T-chart.

WE DO (guided): categorize 2 in the book and 2 in my head

WE DO (collaboratively): have partners categorize 5-6 in the book/in my head questions or in small teams

YOU DO: independently completely the worksheet that requires identifying whether the question is in the book or in-my-head (use this for assessment of objective)

CLOSURE: Remind students of today’s objective. Have them rate their learning/understanding of the objective. “How will what we did today help you with your reading?”

Field Testing Lesson Plan: THINK – ELA (QAR, It Says- Lesson 2)

MATERIALS:

- Highlighters/pencils
- QAR Lesson 1 (in the head vs. in the book)
  - T-chart where students categorized the questions (in the head vs. in the book)
  - T-chart where students will categorize right there vs. think and search (in the book)
- QAR Poster (cover up in my head)
- ~10-12 questions that are right there AND think and search & corresponding passage(s)
  - Use passages from previous lessons so you don’t need to read them again
- Worksheet for independent identification of right there and think and search
HOOK: “Last time we met we talked about the different types of questions, in the head vs. in the book.” (Review)

OBJECTIVE: “Today we are going to go even deeper and find out about the two types of in the book questions and THINK about where we will get clues to help us answer those questions (IT Says).”

I DO: “I know that in-the-book questions have their answers inside the book. There are two types of in-the-book questions, right there and think and search. Right there questions have answers right in the text. The words in the questions are found in the passage as well. For example, (provide an example from previously used passages and its question). The other kind of in-the-book question is called think and search. A think and search question also has its answer in the text, but it might come from many different places. For example, (provide an example from previously used passages and its question). Watch me as I identify whether these questions are right there or think and search in-the-book questions.”

Categorize two right there and two think and search questions on a t-chart or on the In-the-book side of the QAR poster. Think-aloud as you categorize, referring back to the definitions of right there and think and search. Be explicit with SEARCH and THINK critical attributes.

WE DO (guided): categorize 1-2 right there and 1-2 think and search together

WE DO (collaboratively): have partners categorize 5-6 right there/think and search questions or in small teams

Lesson 2:

I DO: Model generating both types of in the book questions. Refer to CA of question

WE DO (guided): generate 1-2 right there and 1-2 think and search together

WE DO (collaboratively): have partners generate 1-2 right there/think and search questions or in small teams

YOU DO: have students generate 1-2 text and me and on my own questions

YOU DO: independently completely the worksheet that requires identifying whether the question is right there or think and search (use this for assessment of objective).

CLOSURE: Remind students of today’s objective. Have them rate their learning/understanding of the objective. “How will what we did today help you with your reading?”

Field Testing Lesson Plan: THINK – ELA (QAR, It Says, I Know - Lesson 3)
MATERIALS:

- Highlighters/pencils
- QAR anchor chart Lesson 1 (in the head vs. in the book)
  - T-chart where students categorized the questions (in the head vs. in the book)
- QAR Poster (cover up in the book)
- 10-12 questions that are author & me and on my own & corresponding passage(s)
  - Use passages from previous lessons so you don’t need to read them again
- Worksheet for independent identification of author and me and on my own questions.

HOOK: “Last time we met we talked about the different types of questions, in the head vs. in the book. (Review).

OBJECTIVE: “Today we are going to go even deeper and find out about the two types of in my head questions and THINK about where we will get clues to help us answer those questions (IT Says, I Know).”

I DO: “I know that in-my-head questions ask me to use what I already know to answer them. There are two types of in-my-head questions, text and me and on my own. Text and me questions make me think about what the author or text is trying to tell me and what I already know. So I use some clues from the text but many from what I know. For example, (provide an example from previously used passages and its question). On my own questions are questions I could answer without even reading the passage because it is based just on my experience and knowledge. For example, (provide an example from previously used passages and its question). Watch me as I identify whether these questions author and me or on my own questions.”

Categorize two right there and two think and search questions on a t-chart or on the In-the-book side of the QAR poster. Think-aloud as you categorize, referring back to the definitions of right there and think and search. Be explicit with SEARCH and THINK critical attributes.

WE DO (guided): categorize 1-2 text and me and 1-2 on my own questions together.

WE DO (collaboratively): have partners categorize 5-6 text and me and on my own questions or in small teams.

Lesson 2:

I DO: Model generating both types of in the head questions. Refer to CA of question
EFFECT OF MEMORY ON COMPREHENSION

WE DO (guided): generate 1-2 text and me and 1-2 on my own questions together.

WE DO (collaboratively): have partners generate 1-2 text and me and on my own questions or in small teams

YOU DO: have students generate 1-2 text and me and on my own questions

YOU DO: independently completely the worksheet that requires identifying whether the question is text and me or on my own (use this for assessment of objective).

CLOSURE: Remind students of today’s objective. Have them rate their learning/understanding of the objective. “How will what we did today help you with your reading?”

Field Testing Lesson Plan: SEARCH & THINK & ANSWER - ELA

MATERIALS:

• Choose a short passage appropriate to the instructional level of the students that has at least 4 questions (explicit and inferential).

• Pencil/Highlighter

• QAR poster

HOOK: “Have you ever looked at the pictures in a book to help you figure out what is happening in the story? How does this help you as a reader? We can use clues from the questions of passages just like you use clues from pictures to help us understand what is being asked.”

OBJECTIVE: “Today we are going to SEARCH through the questions of a passage and see if we can find out which words are important clues for us that we would use to answer the questions. Then we will THINK about how we can use those question clues, clues from the passage and what we already know to help us answer the questions.

I DO: Read the passage with the students. Think-aloud SEARCH & THINK with the first question. Pay explicit attention to action verbs and w-words during search. Use a highlighter/pencil on key words, passage clues and to note background knowledge connections that will help you answer the question.

“I’m going to SEARCH through the first question to see if I can find words that might be important clues for me to answer this question. Watch me as I search for clues. I see… I know
the word __ is important (or not important) to help me answer the question because… I don’t know this word __, but it might be important because…I think the word ___ is a clue because…”

“Now that I’ve searched for those clue words, I’m going to THINK about what these clue question words are telling me that will help me answer the question.” Use QAR to think aloud what the question type is and what key/clue words from search helped you know.

“Now that I know the question is a ____ (QAR type) I can use that information to help me answer the question.

In the book questions:

“I know this is a ___ (right there or think and search) in the book question because ___. Now, I’m going to go back into the passage and find clues that will help me answer the question. I’m going to underline the clues and indicate the question number so I can come back to this proof to answer the question and review my work. I’ll look back through the passage for what IT SAYS that will help me answer the question.” Think aloud this process to students. Answer the question using the IT SAYS clues.

In my head questions:

“I know this is a ___ (text and me or on my own) in-my-head question because ___. Now, I’m going to go back into the passage and find clues that will help me answer the question. I’m going to think about what I KNOW that will help me answer the question (for text and Me: and if there are any clues in the passage that could help me -IT SAYS). Think aloud this process to students. Answer the question using the I KNOW clues and if applicable IT SAYS (text) clues.

“A good strategy before I ANSWER is to cross out the options I know for sure are incorrect. (model this with the question)”

WE DO (guided): “Let’s read the second question and search for any words that might be important… Are there any words that you see that you know already? Are there any words you see that might be important that you don’t know? Let’s highlight those words we see that might be important clues to help us figure out what this question is asking.

“Now that we have searched for this important words, let’s THINK about what type of question this is (QAR).”

“Now that we know what type of question this is from our question clue words, let’s THINK about what other clues we have that will help us answer the question (IT SAYS –text clues; I KNOW – background knowledge).”
“We have all of the information we need in order to ANSWER the question. Let’s cross out the answers we know for sure are incorrect before we decide on our correct answer.”

WE DO (collaborative): “With a partner, I’d like you to read the third question aloud together. You are going to search for those important clue words, decide what type of question it is and use text clues (IT SAYS) and what you know (I KNOW) to figure out the answer. Remember, we cross out the answers options we know for sure are incorrect. You are doing just what you watched me do and what we did together.

YOU DO: “For the last question(s), you are going to search for those important clue words, decide what type of question it is and use text clues (IT SAYS) and what you know (IKNOW) to figure out the answer.

CLOSURE: Provide the group specific feedback about what they did well with and important reminders for improvement of SEARCH and THINK. Ask students to rate their understanding of using SEARCH & THINK with thumbs up, side, down. “How do you thinking SEARCHING for key words or clues in the question will help you? How will THINKING about the type of question it is help us find the right answer? Could you use this SEARCH & THINK strategy in other classes? How?”

Field Testing Lesson Plan: Answer & Review - ELA

MATERIALS:

- Choose a short passage appropriate to the instructional level of the students that has ~6 questions (all types).
- Pencil/Highlighter
- SEARCH anchor chart
- THINK – QAR/It Says, I Say/Know anchor chart
- QAR poster

HOOK: “Have you ever noticed that sometimes there seems like there might be two correct answers on a multiple choice test? Why do you think that is?” (Discuss how the plausible distractor is there to trick the reader and to make sure they used all of their strategies to answer correctly)

OBJECTIVE: “Today we are going to identify the answer option that could be correct, but isn’t (plausible distractor).”
I DO: Read a short passage w/ students with multiple choice questions. Model using search and think just like previous lesson (quicker just to reinforce).

“Before I identify the answer options that could be correct, I’m going cross out any options I know are incorrect. That will leave me with the answer options that could be correct. Now that I’m looking at the answer options that could be correct, I need to think about which one is the MOST correct. I think it is __ (answer option).”

“Before I start the next question, I should REVIEW my choice and make sure I didn’t choose the answer that was there to trick me. Let’s me REVIEW…. I used SEARCH… THINK (QAR/It Says–I Say) which with those clues led me to cross out ___ because ___ and choose option ___ because ___. Let me see if I can identify which answer option is there to trick me and make sure that I didn’t choose one. I think ____ was the answer that was there to trick me because ___. I don’t think that is the best answer because ____.

WE DO (guided): guided students through STAR with 1-2 questions; Spend the most time on R.

WE DO (collaborative): have students go through STAR with 2-4 questions. Make sure students identify plausible distracter.

CLOSURE: Remind students of today’s objective. Have them rate their learning/understanding of the objective. “How will what we did today help you with your reading?”

Field Testing Lesson Plan: Search, Think, Answer, Review – ELA (Two Days – practice & test)

MATERIALS:

- Short reading passage with 4 questions
- Post-assessment

OBJECTIVE: “Today, we are going to practice using our STAR strategy with a reading passage”

HOOK: “How has this strategy helped us become even better readers?”

YOU DO: Read passage together and Model STAR strategy in its entirety with 1 question.

WE DO (guided practice): Practice STAR strategy in its entirety with 1 question.

WE DO (collaborative): Practice STAR strategy in its entirety with 2 questions.

YOU DO: Post assessment (next day)
# QAR (Question-Answer-Relationship)

<table>
<thead>
<tr>
<th>In-the-Book Questions</th>
<th>In-My-Head Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Right There</strong></td>
<td><strong>Text and Me</strong></td>
</tr>
<tr>
<td>• The answer is in the text, “It Says”</td>
<td></td>
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<tr>
<td>• The words used to make up the question and words used to answer the question are found in the same sentence</td>
<td></td>
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<tr>
<td><strong>Think and Search</strong></td>
<td><strong>On my Own</strong></td>
</tr>
<tr>
<td>• The answer is in the text, “It Says” but it will come from more than one place.</td>
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<tr>
<td>• Find all of the clues and combine them to answer the question.</td>
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<tr>
<td><strong>On my Own</strong></td>
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<tr>
<td>• You don’t need to read the passage to answer the question.</td>
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<tr>
<td>• Multiple choice: the answer is in the question. Think about what “It Says” and what “I know”</td>
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<tr>
<td>• Other: the answer is based on what “I know”</td>
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