

Explicit Instruction of Academic Vocabulary in a Pullout Reading Intervention Class as a Response to Intervention in Secondary Schools

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Overview

I teach at a suburban school with an urban population. Many of my students are bussed into school each day, and their parents have a hard time getting to school functions and even IEP meetings. Around 80 percent of the students in my school receive free and reduced lunch. I am a certified reading specialist and special education English teacher. Over the past five years, I created and developed an academic support model that allowed students to remediate their English and reading skills in small groups and gain strategies to help them succeed in their other classes. This class met for 90 minutes every other day for the entire school year.

This year I am teaching a different group of students. The academic support classes continue, but there has been a need for even more reading instruction in our school. I screened every ninth and tenth grader in the school with a word list and a brief reading passage to see if we had missed anyone in our network of support systems. Then I triangulated this data with the standardized tests, grades, and teacher reports for the students. Finally, I interviewed all the students and their parents to see whether they wanted help with their reading skills. In the end, I wound up with 68 students who were not receiving supports for their regular English class, were reading at least three grades below their grade level, and were willing and able to participate in a pullout program. I see these students only 60 to 90 minutes a week. Most have deficits that seem insurmountable. I want them to succeed in class as soon as possible so that they don't lose hope and drop out. I want them to love to read and be able to contribute and be comfortable in their content area academics. But I have so little time. And they have so much need.

Rationale

How can I make an impact in their learning as quickly as possible? What one thing can I teach kids that will transfer into every aspect of their education and learning? I started with that daunting question and began to research why students in today's society seem to be losing ground in reading comprehension. With mean reading scores on the SAT at their lowest in the last ten years, it seems clear that student achievement is lagging.¹ In my classes, the most shocking recent development has been the students' lack of background knowledge and vocabulary when they come to me. I found myself thinking,

“What **do** they know?” My background and education as a teacher of reading gave me an understanding of the importance of connectivity in the brain when reading. I know students understand what they are reading only when they are able to connect the new information on the page to their own schema. With this in mind, I started teaching almost everything experientially so that students could connect their reading to their classroom experience. That way I didn’t have to depend on their prior knowledge because we created it before the lesson. This strategy seemed to remedy some of the larger issues regarding schema. But students were still struggling in other classes, on standardized tests, and in written expression. I realized I had to equip the students with something to take with them to connect to other areas when they left me. What’s the one thing I could give them to serve them well? Words.

In the classroom, vocabulary is all the words that students need to know to succeed in reading, speaking, and writing. Without words, students cannot express themselves fully, and they are at a loss when it comes to writing and speaking. As for the tie between vocabulary and reading comprehension, researchers say there is a direct correlation.

William Nagy asserts that “vocabulary knowledge is fundamental to reading comprehension; one cannot understand text without knowing what most of the words mean...a reader’s general vocabulary knowledge is the single best predictor of how well that reader can understand text.” That’s a pretty powerful argument for teaching vocabulary, but as Nagy’s book explains, failure of vocabulary instruction is far more common than success. It’s difficult to create in-depth word knowledge, and it’s also difficult to know which words will affect the reader’s understanding of the text and which words won’t.²

According to the Global Language Monitor, the number of words in the English language has almost doubled within the last century.³ This influx of vocabulary creates a vacuum in which my kids know words, but not the right words. Until the testing mindset falls away, it’s imperative for me to train students to show what they know in a more traditional sense. When students are low performers on state tests, they get labeled as stupid by their peers, some close-minded teachers, and most importantly themselves. My kids need to know they aren’t stupid; they are disadvantaged, from day one.

Teaching high school reading to poverty-stricken adolescents creates an awareness of the achievement gap and its relation to this disadvantage. Hart and Risely in *Meaningful Differences in the Everyday Experience of Young American Children* uncovered evidence of this gap through a startling discrepancy between the number of words that children between the ages of one and four is exposed to in a welfare household and in a professional household. According to their study, the children in the welfare house will be exposed to over 30 million fewer words. This is exposure to oral vocabulary, but the connection to the written word is obvious. Children who have never even heard a word before will certainly have a much more difficult time connecting to that word

phonetically when they first begin reading. This naturally leads to an achievement gap once school begins, since students living in poverty start in a state of “catch-up.”⁴ This inevitably leads to the “Matthew Effect,” which becomes even more obvious in high school. Matthew’s Gospel reads, “For unto everyone that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath” (25:29). In a nutshell, the rich get richer and the poor get poorer.

Researchers have noted repeatedly that some children come to school somewhat “wealthier” than their peers when it comes to early reading skills. As time goes by, those students who start out with some literacy advantages tend to thrive and grow academically, while their less fortunate peers tend to get left behind.⁵

Research shows a direct impact of the Matthew Effect in correlation with vocabulary acquisition. Children who enter school with limited vocabulary achieve much less additional vocabulary growth than their peers. In fact Baker, Simons and Kame’enui claim that students learn between two and eight words a day at the start of their education. This number varies depending on the number of words that a student already knows when entering school. This difference quickly adds up. By the end of a year, a student coming into school with a smaller vocabulary learns only 750 words compared to the more accomplished vocabulary aficionado’s additional 3000 words.⁶ Not surprisingly, by the time students are in high school they lose hope, stop reading, and give up on themselves because of constant failure.

Pairing these observations with brain-based research, I have also uncovered information that EEGs of the brains of children living in poverty show a prefrontal lobe similar to that of a stroke victim. “Most low-income children have these disparities in neurocognitive development: language, memory ability, working memory and executive function. However, visual and spatial cognitive ability did not differ significantly from middle class children.”⁷ Moreover, the actual number of words heard in a family on welfare is about 1500 words less than the number of words heard in a professional household. Even more discouraging is the number of affirmations and prohibitions heard in these houses. Children growing up in poverty hear about eleven prohibitions in an hour and only five affirmations, while their counterparts growing up in a professional household hear thirty-two affirmations in an hour and only five prohibitions.⁸ No wonder so many of my students have lost hope and the desire to ask questions and learn. Constant reprimands have made students far less creative and inquisitive by the time I encounter them fifteen years later.

As I delved deeper into brain-based learning and research on memory, both spatial and rote, I uncovered more information that impacted my classroom instruction. Students should only be given around ten words a week to learn, and these words should be meaningful to the work they are doing in class in order to make those meanings stick. Students need to be able to have conversations around the words and be exposed to the

words in multiple ways with multiple connections. Only through this process can the words go from their short-term memory to their long-term bank; only through this process will students truly “own” these words and be able to use them in every class, every test, and everyday life. This is my golden ticket. If I can get my kids to learn the right words, then I can rebuild their self-esteem and hope and increase their achievement.

According to Marzano, direct instruction of vocabulary can produce a 33% growth in reading comprehension. He further asserts that the number one thing that teachers can do to make sure that students, particularly those from low SES backgrounds, understand what they are reading is to teach the vocabulary prior to the reading.⁹ It makes sense; we are leveling the playing field for the whole team. It also gives pause to the naysayers who claim that students who aren't reading on grade level by third grade will not be able to close that gap. More recent research show synapse growth in brains well into adulthood. Although students come to me in high school with many of their hard wiring already in place, there is ample room and time for some rewiring. Like most major electrical overhauls, however, this is no easy task.

I began with trying to uncover an easily understandable text regarding how our memories work, specifically in terms of learning. According to Ormrod, many people remember much of what is taught to them in school. But how long we remember that information depends on many variables.¹⁰ Researchers have found that humans retain concepts and ideas much longer than mere names and dates.¹¹ In addition, the amount of material that we remember begins to dissipate quickly just weeks after instruction stops.¹² The good news is that whatever information students remember twelve weeks after they have learned it they have the capacity to remember forever.¹³

There are many variables that lead to long-term memory retention. Bower and Karlin have proposed a theory of levels-of-processing: the more mental processing you perform with a specific learning stimulus, the more likely you are to retain it.¹⁴ Other theories consider the variables of emotional stimulus, original context of material taught, and student motivation to remember. Interestingly, much of the research claims that both struggling readers and strong readers show a similar loss of materials over the long term, even though the stronger readers are able to retain material in the short term more effectively.¹⁵

A study on second graders reported:

We assessed the ability of good and poor readers in the second grade to remember three different types of material: photographs of unfamiliar faces, nonsense designs, and printed nonsense syllables. For both faces and designs, the performance of the two reading groups was comparable; only when remembering the nonsense syllables did the good readers perform at a significantly superior level. These results support other evidence that distinctions between good and

poor beginning readers do not turn on memory per se, but rather on memory for linguistic material. Thus they extend our previous finding that poor readers encounter specific difficulty with the use of linguistic coding in short-term memory.¹⁶

This study reinforced what must happen to bridge the gap between the struggling readers and the strong readers in a class. Words must be taught prior to readings and they must be taught with some sort of non-linguistic representation. Students must be allowed to use one of their more developed literacies to improve their lexical literacy. This process also increases the connection for the strong readers and helps them to own new vocabulary words even more quickly. Because it taps into more intelligences, modes, and literacies, this explicit instruction of vocabulary using non-linguistic representations is best practice in any classroom.

My students need these strategies even more. In *Words, Words, Words*, Janet Allen talks about her epiphany. “I realized that the fluent readers in the classroom had internalized ways to learn new words and connect them to future reading. Those readers who were struggling needed to spend a lot of time reading, but they also needed me to show them how readers make sense out of unknown words.”¹⁷ This explicit connection creation and subsequent transfer of the skills is the one that so many teachers miss. It’s the one that I was missing. How could I make my students metacognitive and reflective about their vocabulary acquisition in a way that would make these academic words, which are often dry and uninspiring, stick?

The theory that most affected my teaching unit’s development was the dual-code theory of memory. This theory, proposed by Clark and Paivio in 1991, creates the hypothesis that information is captured in our long-term memories in two ways: visual and verbal. This theory further asserts that the learner better remembers information that is presented in both ways than information presented only one way.¹⁸ Think for a moment about the most successful lessons you have ever taught. Doubtless you used this theory unconsciously when you taught that lesson. Look at how many of the multiple intelligences you tapped into when you created that lesson. The more learning modalities you hit when teaching a concept or idea, the better students will remember the material. Additionally,

memory does not depend on depth of processing alone but also on the way in which information is learned and then tested. Their transfer-appropriate-processing theory holds that the strength and durability of memory depend not only on the depth of processing but also on the similarity between the conditions under which the material was learned and those under which it is called for. This distinction helps to explain why so many students can recall and apply rules of grammar and punctuation on a multiple-choice or fill-in-the-

blank test (a format similar to that in which they learned these skills) but are unable to recall or apply the same skills in their own writing.¹⁹

This distinction is especially important for my students and this unit because it dramatizes the problem that I have been encountering for years in the classroom regarding transfer. Standardized tests ask my students to recall information traditionally, whereas I am often teaching that information to them unconventionally. Perhaps, I reflected, my teaching style was interfering with student recall because I wasn't being clear about what was being taught. In my efforts to spice up the content, I had allowed the process to supersede the content. Because of my decision, students were able to tell me all about a lesson from weeks ago, but they were not able to tell me why we had that lesson. How could I best teach these words in an exciting way while making sure that the words themselves remained the focus of instruction? They had to be connected to a concept, they had to be taught in a meaningful manner, and they had to be taught using many different modes of learning. My research kept bringing me back to teaching vocabulary explicitly to get students' reading comprehension raised in all areas. The tie between vocabulary acquisition, memory, and reading comprehension was clear.

The items in the domain of information can be conceptualized as existing in a hierarchy. At the bottom of the informational hierarchy are "vocabulary terms." A vocabulary term is comprised of a word or phrase with associated semantic and/or episodic characteristics that distinguish it from other vocabulary words. As described in Chapter 2, words are the building blocks of propositional networks. At a practical level, it is fairly obvious that students must understand a certain amount of the basic vocabulary in a subject area before they can understand the facts, generalizations, and concepts within a content area. This might explain why teachers frequently must devote a significant amount of time to vocabulary instruction.²⁰

Without this basic building block, students struggle to succeed in every area. Since my students had even fewer words than the average student, this task of learning up to a hundred words per chapter in each content area created a sense of overwhelming hopelessness in them. The number of words a student is responsible for knowing through the course of a content area high school textbook far outweighs the number of words that the student is capable of learning. This problem is compounded when students enter the grade with the below-grade level vocabulary with which my students have been working.

12 Brain/mind Learning Principles in Action proposes relaxed alertness and active processing as the two greatest contexts we can create that will help our students learn. In addition, the book discusses the use of imagery, metaphors, and analogies to help students retain information. Here imagery is defined as student-created images and touted as a high-result producing mnemonic device for high school students.²¹

Allen discusses the ways that she

supported students' developing word knowledge in a variety of ways: Repeated words in varied contexts, described words, supported words with visuals, connected words to students' lives, extended words with anecdotes, made associations, gave definitions, compared and contrasted, questioned, charted characteristics, rephrased sentences, analyzed structures, provided tactile examples, gave examples of correct and incorrect usage. I found at least five reasons I needed to incorporate this type of direct vocabulary instruction: to increase reading comprehension; to develop knowledge of new concepts; to improve range and specificity in writing; to help students communicate more effectively; and to develop deeper understanding of words and concepts of which they were partially aware.²²

Marzano also discussed the things that he has done to teach academic vocabulary explicitly. He has broken the process down into six steps for teachers to follow:

The focus of steps 1-3 is on introducing new terms and steps 4-6 offer ways to review the terms providing students with a deeper insights.

1. Provide a description, explanation, or example of the new term. If working with ELL students, the teacher should first provide the description in the native language and a visual representation of the word.
2. Ask students to restate the description, explanation, or example in their own words. ELL students may write their definition in their native language.
3. Ask students to construct a picture, symbol, or graphic of the term. This activity is critical for ELL students.
4. Engage students every other week in activities that help them add to their knowledge of the terms.
5. Every other week ask students to discuss the terms with one another.
6. Once a week involve students in games that allow them to play with the terms.²³

Another research-supported vocabulary strategy that Doug Buehl proposes in *Classroom Strategies for Interactive Learning* is student-friendly vocabulary explanations. This strategy was developed to help students get the feel of a word rather than just looking up the word in the dictionary and then using it incorrectly in a sentence (as apparently two-thirds of students were doing). In this five-step strategy, teachers have the students discuss the words with them and create a word study guide in their own

journals so that they can track their progress and even self-selected words. The four columns in the word study guide are: 1. word/found in sentence, 2. explanation, 3. examples, and 4. visual image. More than the diagram, the most important part of this strategy is the discourse that needs to develop between student and teacher and among students to create a usable real-world definition of the word.²⁴

Zwiers suggests that students can become self-monitors of their reading by creating their own internal strategies when they come to difficult vocabulary roadblocks. One strategy that he discusses, very similar to semantic mapping, is a nice marriage of linguistic and non-linguistic modalities. It is called Connect the Words activity, and is merely a map on which students can connect words to one another and explain the connections.²⁵ This strategy is interesting because it allows students to create a metacognitive diagram of their understanding of words. It also ties into Novak's studies on the hippocampus and its connection to memory organization and retrieval. One of the ways to create such explicit connections is through concept maps.²⁶

I felt I had uncovered a lot of great research regarding how the memory works, how the words need to be taught, and even some specific research-based strategies that I could work into an academic vocabulary unit. But the question still loomed: which words should I teach and in what context?

Companies that want you to buy their products have created many academic word lists. Other lists have been created by individual teachers and tied directly into their content, which is great for the teacher, but not very helpful for me. Since my responsibility is not to get through a specific curriculum, there's no way to prioritize my chosen vocabulary into tiers so that I can isolate the most important words to teach. This tier separation is the methodology of Beck, McKeown, and Kucan.

It is Tier 2 that contains words of high frequency or mature language users. They are also words of general utility, not limited to a specific domain. Some examples might be *remarkable*, *forlorn*, *cherish*, *awe* and *exaggerate*. We have asserted that it is words of this type toward which the most productive instructional efforts can be directed. Because of the role they play in a language user's verbal repertoire, rich knowledge of words in the second tier can have a significant impact on verbal functioning.²⁷

For my purposes, I need a generic list that will help all of my students achieve better. My school district just invested in an informational text program that students are required to use. This program uses the Coxhead list from 2000 as its academic vocabulary bible. I decided since these are the words on which many of my students will be assessed, they are the words that I should teach. The Coxhead list is 570 words that are not part of the most used vocabulary lists (Dolch and Frye) but that occur frequently in higher-level texts. They are grouped into ten sub-lists (ranked by frequency and range of

use of the words on the sub-list). Although the most often used form of the word is the one on the list, all forms of the word should be addressed to some level when they are taught.²⁸ This is where additional explicit instruction in word families and affixes comes into play.

I currently have a class filled with struggling readers who are exposed to different classes and so have a different tier three vocabulary to which they need exposure. What do all of these students have in common? They are all reading between three and seven grades below their current grade level. They are all feeling frustrated and hopeless in their content area classes as they struggle through text and vocabulary that is far above their reading capabilities. I have to get these kids some tools so that they can handle some of the texts they are facing on a daily basis. Luckily, they are also all being exposed to similar academic vocabulary.

Coxhead (2000) referred to these words as *academic words* and defined them as 'lexical items [that] occur frequently and uniformly across a wide range of academic material' (p. 218). In fact, she did much more than define general academic vocabulary. Coxhead assembled a corpus of 3.5 million running words from college-level texts (e.g., journal articles, book chapters, full books) in content areas such as history, linguistics, economics, marketing, law, biology, chemistry, and physics. She then (a) excluded those words that were among the most frequent 2,000 English words and (b) included words that occurred at least 100 times in the 3.5 million running words and occurred in 15 or more of the 28 content areas sampled.²⁹

These are the words that will have the greatest immediate impact on the student's learning. Explicit instruction of these words, using multiple modalities and different literacies, is the best focus for vocabulary instruction.

In addition, I must be cognizant of all we now know about the brain and its ability to learn so that I can connect the important words to as many synapses as possible in as many different modes as possible in order to create a lasting memory of the words. I must create a learning environment of relaxed alertness and active learning. I must make sure that my students can transfer the knowledge they have of each word to their other classes. Because they must be able to use these words, they must have an in-depth understanding of them. By using Jensen's principles of teaching with emotion, kinesthetic, visual, non-linguistic, and linguistic representations and tying his research into the strategies of Buehl and Zwiers, I can create a unit that allows my students to become masters of these important vocabulary words and use them in all of their classes with success.

One proven way to help students learn and remember vocabulary words is by tapping into the many literacies available in today's technological society. With all the technology available to teachers and students, we can now have students create comic

strips, Prezis, PowerPoint presentations, and even web pages that capture and share their visual representations of abstract vocabulary concepts and words. This technology can further be used visually to show the connections between words for a specific student so words are accessible and retrievable by the hippocampus. This type of visual and creative learning and remembering will be the focus of my instructional unit.

The Plan

The Coxhead word list has 570 words. Considering that I see most, but not all, of my students for multiple years across their high school career, I split the sub lists into sessions. For example, sub list one (which contains the words with the highest frequency of recurrence) would be taught in session one. That means no matter how often I see a student for a tier three intervention (one quarter or sixteen quarters), he or she will have been exposed to the most important academic words. Since each sub list is fifty-seven words long, the sub lists will be split up across the weeks that I see the student. So for a nine week quarter, we will cover five to seven words a week. By quarter's end, the entire sub list will be complete. Students I see from their freshman to their senior year will be exposed to all ten sub lists over the course of their sixteen quarters of school, with time for review and remediation.

Sample Unit

Session One

The first five words on sub list one are: assess, analyze, area, approach, and assume. To start the intervention period, students will be given the cloze test below which contains blanks for these five words. The words will not be given to the students; they will have to do their best to fill in the blanks with the directions: "Using academic vocabulary words, complete the following paragraph."

*Students are often asked to **analyze** graphs and maps in many subjects and then use this information to answer questions. One **approach** that some students develop is to randomly guess answers. They **assume** that they will not be able to find the information on the graphs necessary to answer the questions. If a question asks the **area** of a rectangle, for example, and then the graph gives the equation to **assess** the area, often students would rather guess than try to figure out the answer by doing some work. Is this a reading issue?*

The words that are bolded will be replaced with underscores for the purposes of the test and students would make their best effort to fill in the blanks. Often students are able to come up with synonyms during this time that will later aid in our definition discussions. As you can see, I try to tie the vocabulary into an issue many of my students share in order to get them interested or at least activate their prior knowledge. I am sure

that many of my students have guessed at a text rather than try to figure out what the graph really says!

Once the Cloze test is administered, we begin the class with an activation strategy I call Rebus Words. In this portion of the class a PowerPoint is shown that has rebuses created for each of the academic words. (You can find the slides at http://www.slideshare.net/michellemorton/academic-vocabulary-rebuses-week-1?from=share_email.) Students are invited to try to guess the words based on the picture equations without any guidance at first, and then are given the words to try to match. Lastly the rebuses are solved, on a delay, for them.

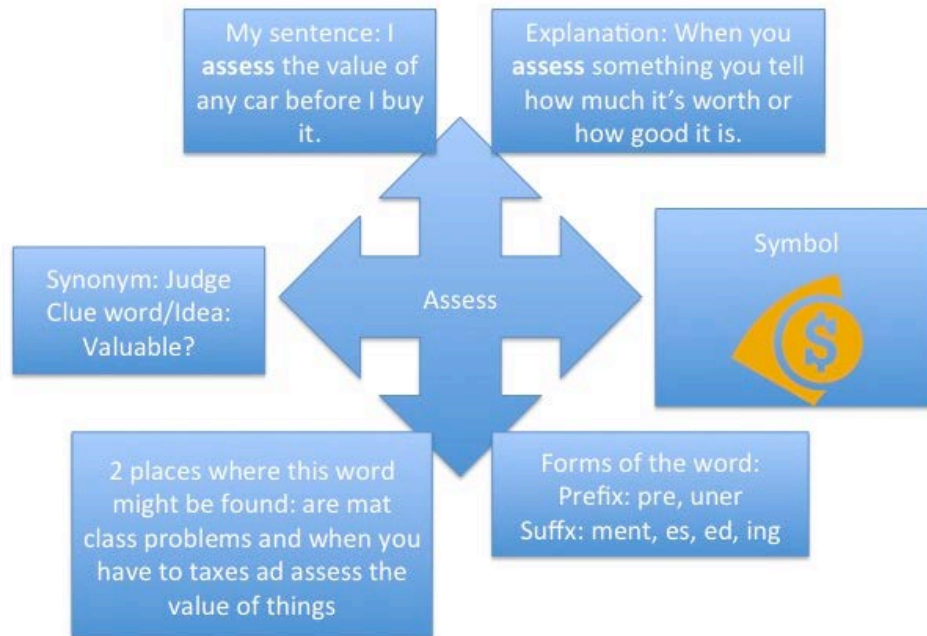
Session Two

Now that the students have been exposed to the words, we will take a moment at the start of class and have a discussion around each of the words. On the board I will write each word and then have each student come up and mark their knowledge of that word with a one, two or three. One means they have no idea what the word is or even how to say it, two means they have seen it in print, and three means they could use it correctly in a sentence. We will then discuss each word. I will give back their Cloze tests from the prior session and have them look at the words they filled in the blanks. Now that they know the academic vocabulary, can they use it? Can they replace their words with the correct ones? Do they have any good synonyms listed in the blanks they can share? This is a time for discussion and sharing.

Once they are done, I will have them create journal entries for one word at a time. Students are assigned a word and responsible for creating a chart or web that includes the following information: their word, used in a sentence, with an explanation, two examples of how it might be used, a synonym or clue word, any other forms of the word they can think of, and a visual image.

Figure one shows a possible journal entry. This entry has an example entry for assess. Assess is set in the middle of the journal page. Students are required to brainstorm answers to all of the questions above. One that I try to enforce is the where would you see this word used. I try to make sure they have one example that happens in the school and then one real world example to show that this vocabulary extends beyond the walls of the classroom. In addition the clue word is an important concept that some students struggle to come up with. This clue word is the word you will use to help cue students when they get stuck. I like to have students come up with their own cues so they can really connect those synapses and trigger their memories. I also find the more creative and outlandish the clue word is the better the connection lasts. If students are forced to create analogies with these clue words and then explain those clues to the class, it is a very powerful memory creator.

Figure 1



In my room we do a lot of work with morphology and affixes. Make sure you give students access to this information with posters of possible suffixes and prefixes. The “forms of the word” box is important because many students know one form but don’t recognize it when they see a different prefix on the same word. Make sure your students know that the word they are looking at is the root, and from that can come many words! Make it fun. Have them make up words that aren’t real and tell you what they think they would mean if they did exist (for example: “monoassessary,” one who makes one test).

Session Three

Students will share their journal entries with their classmates and then will decide on the best symbol for each word. These symbols will be recorded and should be simple. For example, assess=\$. Students will go back to their cloze paragraph again and draw the symbols above each word.

Then we will do a reading that has all five words in it. Every time they come to one of the vocabulary words, they will draw the symbol above it.

Session Four

Students will be given the same Cloze paragraph with the **symbols**. Now they have to remember what the words are that correspond to each symbol. They will write the words next to each symbol. Answers are shared and discussed. Confusion is replaced with insight.

Session Five

Students will be given the paragraph one last time with blanks in it. They are responsible for writing each academic vocabulary word in the correct place.

As you can see from the above schedule, it will take five sessions to get through five to seven words, but the session time required varies based on the vocabulary activity, so you will have time to work on other skills during the course of this unit of study.

Reviewing

At the end of each quarter, students are responsible for a quarterly assessment based on the words that we have covered during that session. In this way teachers can check for long-term retention of vocabulary words.

Appendix A

CCSS RI4: Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).

CCSS RI10 By the end of grade 9, read and comprehend literary nonfiction in the grades 9–10 text complexity band proficiently, with scaffolding as needed at the high end of the range.

By the end of grade 10, read and comprehend literary nonfiction at the high end of the grades 9–10 text complexity band independently and proficiently

CCWS2d. Use precise language and domain-specific vocabulary to manage the complexity of the topic

Annotated Teacher Bibliography

Allen, Janet. *Words, Words, Words: Teaching Vocabulary in Grades 4-12*. York, Me.: Stenhouse, 1999.

This book provides information on how to teach vocabulary in the middle and high schools with research based strategies.

Bahrlick, Harry P., and Lynda K. Hall. "Lifetime Maintenance of High School Mathematics Content." *Journal of Experimental Psychology* 120, 1 (1991): 20-33. This article provides information on memorization, specifically, related to mathematical information retention.

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Beck, Isabel L., Margaret G. McKeown, and Linda Kucan. *Bringing Words to Life: Robust Vocabulary Instruction*. New York: Guilford, 2002. This book gives strategies for visualizing and connecting vocabulary in order to create lasting meaning for the student.

Bower, Gordon H., and Martin B. Karlin . "Depth of Processing Pictures of Faces and Recognition Memory." *Journal of Experimental Psychology* 103, 4 (1974): 751-757. This article gives information about how memories last longer when they are connecting visually to something else in the brain.

Bransford, John D., Barry S. Stein, Nancy J. Vye, Jeffery J. Franks, Pamela M. Auble, Karen J. Mezynski, and Greg A. Perfertto. "Differences in Approaches to Learning: An Overview." *Educational Psychology Review* 3 (1982): 390-398. This article discusses how student transfer information from short-term to long-term memory and how to facilitate that transfer in the classroom.

Buehl, Doug. *Classroom Strategies for Interactive Learning*. 3rd ed. Newark, Del.: International Reading Association, 2001. This book gives real life, practical applications for middle and high school students who need more support in content area reading.

Caine, Renate Nummela. *12 Brain/Mind Learning Principles in Action: The Fieldbook for Making Connections, Teaching, and The Human Brain*. Thousand Oaks: Corwin, 2005. This book gives background about the workings of the brain and how it learns and then applies this background to classroom learning.

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ability to learn better when information is provided in multiple modalities.

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This article discusses how long we remember information learned in schools and the inner workings of memory and long-term retention.

Coxhead, Averil. "A New Academic Word List." *TESOL Quarterly* 34 (2000): 213-238. This article creates a word list of the words most often used in texts in college, that are not already on the more common lists of words given to students. This list is the foundation of this project.

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This groundbreaking book shows the differences in lifestyles between the classes and attempts to connect these differences to classroom learning and IQ.

Jensen, Eric. *Teaching with the Brain in Mind*. Alexandria: Association for Supervision and Curriculum Development, 1998.

This book gives strategies for teaching to the strengths of the human brain in order to get the best results.

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