Comparing Strategies for Teaching Vocabulary: Word Frames and The Frayer Model

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Abstract

Two strategies for teaching vocabulary were investigated for this study; a teacher selected strategy utilizing word frames for instruction, and utilizing the Frayer model for vocabulary instruction. The purpose of this study was to identify which teaching strategy was most effective for vocabulary instruction. The participants for this study were a class of twenty-five fourth-grade students in an elementary school serving grades kindergarten through fourth grade. For both strategies, students were given a pretest over eight selected vocabulary words. The students then received four days of instruction, followed by a posttest over the same words. Student scores from pretest to posttest showed little improvement when instruction was given in the teacher selected word frame strategy. Data from the use of the Frayer model showed that the student scores improved from pretest to posttest. Examination of the data suggests that the Frayer model of vocabulary instruction is an effective way to teach vocabulary, while the teacher selected word frame method was not an effective way to teach vocabulary to elementary students.

Keywords: Frayer model, vocabulary instruction

Vocabulary instruction is a critical component to any solid teaching framework. Vocabulary has been identified as one of the "Big Five" components of reading instruction and should be included in teaching reading at all levels. In the fourth grade, direct vocabulary instruction becomes very important in the content areas (science, social studies, mathematics) as students are asked to read for information.   Effective vocabulary instruction can increase student comprehension in reading and in all of the content areas. The following research articles describe how explicit vocabulary instruction boosts comprehension and one particular strategy for teaching vocabulary.

Review of the Literature

Hawkins et al. (2010) examined the use of listening previewing and vocabulary previewing to improve reading comprehension and vocabulary. The researchers found, in a class or 21 general-education fourth graders, that using listening previewing and vocabulary previewing activities improved student performance on comprehension questions (both factual and inferential) and vocabulary-matching probes. It is interesting to note that the research was done on an entire class, instead of as a small-group intervention.

Monroe and Pendergrass (1997) examined the use of the Frayer Model for vocabulary instruction in a fourth grade mathematics class. Students were given vocabulary instruction utilizing a Frayer Model concept map, while other students were instructed with a definition-only model for mathematical vocabulary. The knowledge of vocabulary was assessed through the students' mathematical writing before and after instruction. After instruction, there was a larger number of mathematical vocabulary terms used in student writing by the group that received instruction with the Frayer Model. The implication of the study is that the Frayer Model is an effective method for teaching mathematical vocabulary.

The Frayer Model is a graphic organizer for the study of vocabulary words. It can be used in regular class settings or special education class settings. It can be used with a large group, small group, or individually. The Florida Center for Reading Research (2006) defines the Frayer model as "An adaptation of the concept map. The framework of the Frayer Model includes: the concept word, the definition, characteristics of the concept word, examples of the concept word, and non-examples of the concept word." (Teacher Resource Guide, p. 48) Using the Frayer Model in vocabulary instruction encourages students to use critical thinking to identify and understand vocabulary that is not familiar to them. This strategy also helps students build connections between new concepts and provides a visual reference for the student to use (AdLit.org).

The Florida Center for Reading Research (2006) notes that "It is important to include both examples and non-examples, so students are able to identify what the concept word is and what the concept word is not." (Teacher Resource Guide, p. 48). The Frayer Model can be used

to introduce vocabulary words by providing students with a completed model with only the vocabulary word missing. It can be used by students to deepen their understanding of a word that they have been introduced to, as they fill out the various parts of the model for a given word. The model can be used as a reference or review, with completed Frayer models posted in the classroom or on the back of word wall cards (oame.on.ca).

For the purposes of this research project, the Frayer Model will be used in a whole-class setting. Students will participate in completing their own Frayer Models for vocabulary words identified as unfamiliar to students. The students will be encouraged to use their completed Frayer Models as a study guide for vocabulary testing. The use of the Frayer Model to teach vocabulary will allow the comparison of the results of the way the teacher normally taught vocabulary to be compared to the results of using the Frayer Model.

Methodology

Participants

The participants for this study are 25 fourth-grade students. They range in age from nine years old to eleven years old. There are 13 males and 12 females in the class. Two students receive special education services for learning disabilities in reading through thirty minutes of pull-out instruction daily. One student receives special education services for learning disabilities in math, reading, and writing. He receives pull-out instruction for 150 minutes daily. One student receives special education services for emotional/behavior disorder and has paraeducator support throughout the school day. No students are eligible for ELL services.

Teacher-selected Vocabulary Instruction

Eight vocabulary words from Native American background were chosen for this study. The words were: moccasin, powwow, totem, tepee, kayak, parka, igloo, and papaya. These words were selected because they were highlighted in the spelling unit that the class was preparing to study.

Assessments. The assessment for these words was a matching quiz (see Appendix A). The words were listed in a word bank and definitions for each word were listed below the word bank. The students were asked to write the vocabulary word that matched each definition. The pretest was given on Monday to the entire group, and the posttest on Friday, again, to the entire class. The pretest and posttest were identical. The assessments were scored with each correct word matched to a definition being worth one point, for a total possible of eight points.

Procedures. Instruction for these words was delivered in the following ways: each student was given a list of the words and assigned one word for which to complete a vocabulary frame. In the vocabulary frame, the student was asked to tell the meaning, draw a picture, use the word in a sentence, and tell what the word "isn't" (antonyms). The students then shared the frames with one another and again discussed all eight of the words. This activity was done by small groups of students with an aide supervising. Additionally, the class participated in a

whole-group, teacher-directed lesson where the words were used in a matching activity with definitions.

Results for the teacher-selected strategy. Figure 1 shows the results of the pretest and posttest for the 25 fourth grade students taking the fourth grade Native American vocabulary test.

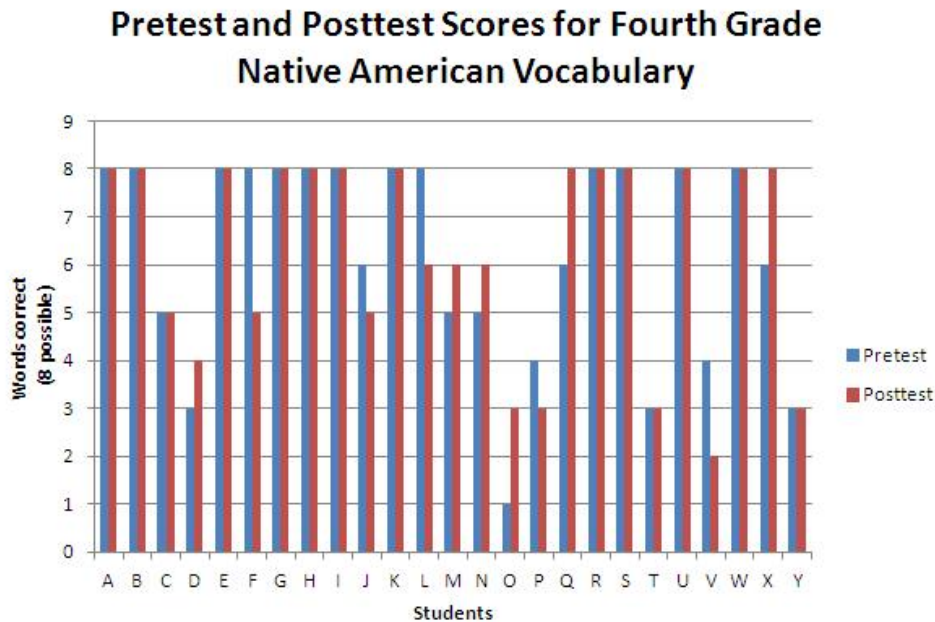**Pretest and Posttest Scores for Fourth Grade Native American Vocabulary**

Figure 1. Pretest and posttest results for 25 fourth graders on a Native American vocabulary test.

Pretest scores ranged from 1 to 8. Thirteen students had perfect scores on the pretest. The mean score on the pretest was 6.2. Posttest scores ranged from 2 to 8. Thirteen students had perfect scores on the posttest. The mean score on the posttest was 6.2.

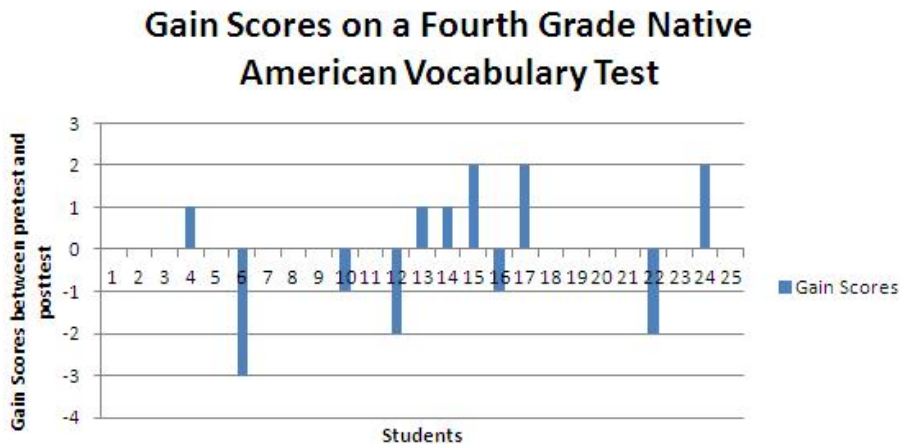Figure 2 showsgain scores for the 25 students taking the fourth grade Native American vocabulary test.

Figure 2. Gain scores for 25 fourth graders on a Native American vocabulary test.

Fourteen students showed no change in their pretest and posttest scores. Thirteen of these had a perfect score on the pretest. The fourteenth student scored three on both the pretest and the posttest. Two students scored one point lower on their posttest, two students scored two points lower, and one student scored three points lower, for a total of five students who scored lower on their posttest as compared to their pretest. Three students made a one point gain from pretest to posttest, and three students made a two point gain, for a total of six students who scored higher on their posttest as compared to their pretest.

Research-based Vocabulary Strategy

For the second study, eight vocabulary words from the Social Studies textbook were selected. Words selected were those that were important for the students to understand to be successful in the study of the Mississippi River. The words chosen were unfamiliar to the students and specific to the current unit of study. The words were silt, tributaries, source, delta, wetland, river basin, mouth, and port.

Assessments. The assessment for these words was a matching quiz (see Appendix C). The words were listed in a word bank and definitions for each word were listed below the word bank. The students were asked to write the vocabulary word that matched each definition. The pretest was given on Monday to the entire group, and the posttest on Friday, again, to the entire class. The pretest and posttest were identical. The assessments were scored with each correct word matched to a definition being worth one point, for a total possible of eight points.

After pretesting, words that were most unfamiliar to students were identified by noting which words were missed the most often on the pretest. Those four words (river basin, delta, silt, and source) were then the focus of instruction using the Frayer model.

Procedures. Whole-class instruction was given in the Frayer model (see Appendix D). Each student had copies of the Frayer model and the teacher demonstrated how to fill in the model for each word, eliciting responses from the class for each section of the model. Students were asked to use their textbook and prior knowledge to help find definitions, characteristics, examples, and nonexamples for each of the four words. The students were then asked to use their Frayer models as study guides before the posttest was given. The remaining four words were assessed on the posttest, although instruction using the Frayer model was not delivered for those four words.

Results. Eight vocabulary words were studied by 25 fourth grade students. The students were given a pretest, instructed using the Frayer model, and given a posttest. Figure 1 shows the results of the pretest and posttest for the 25 fourth grade students taking the social studies vocabulary test.
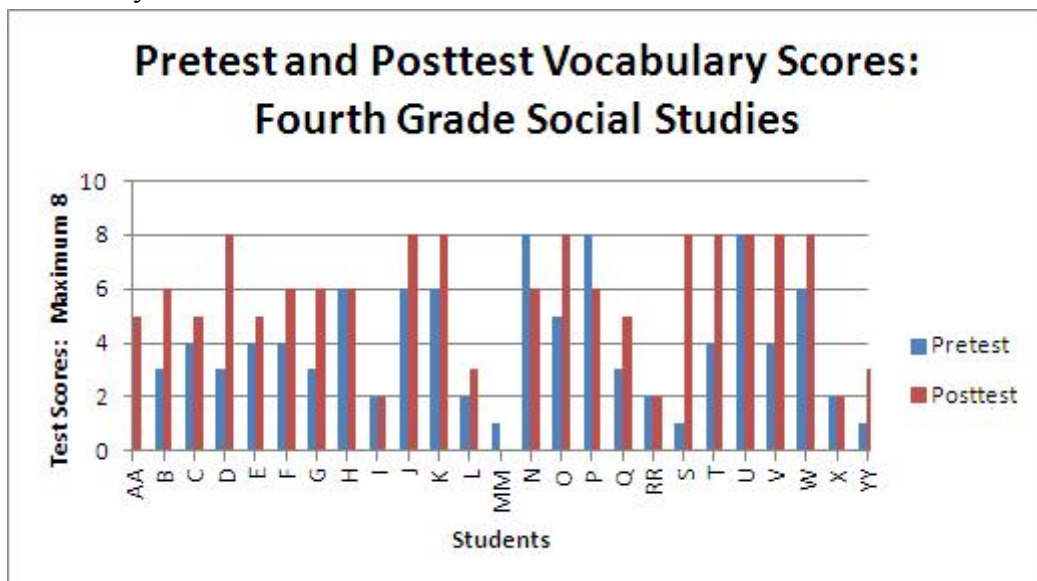

Figure 1. Pretest and posttest results for 25 fourth graders on a social studies vocabulary test.

Pretest scores ranged from 1 to 8. Four students scored perfect scores on the pretest. Mean score for the pretest was 4.1. Girls' (students AA through L) scores ranged from 2 to 8. One girl had a perfect score on the pretest. The mean score for girls on the pretest was 4.3. Boys' (students MM through YY) scores ranged from 1 to 8. Three boys had perfect scores on the pretest. The mean score for boys on the pretest was 4.1. Students receiving services for special education (students AA, MM, RR, and YY) had scores ranging from 1 to 8. One student receiving special education received a perfect score on the pretest. The mean pretest score for students receiving special education was 3.

Posttest scores ranged from 0 to 8 when considering the entire class. Nine students in the class scored perfect scores on the posttest. The overall mean score for the posttest was 5.6. Girls' posttest scores ranged from 2 to 8. Three girls had perfect scores on the posttest. The mean posttest score for girls was 5.7. Boys' posttest scores ranged from 0 to 8. Six boys had perfect scores on the posttest. The mean score for boys on the posttest was 5.5. Students

receiving services for special education had posttest scores ranging from 0 to 5. No students receiving special education had perfect scores on the posttest. The mean posttest score for students receiving special education was 2.5.

Figure 2 shows the gain scores for the 25 students taking the fourth grade social studies vocabulary test.
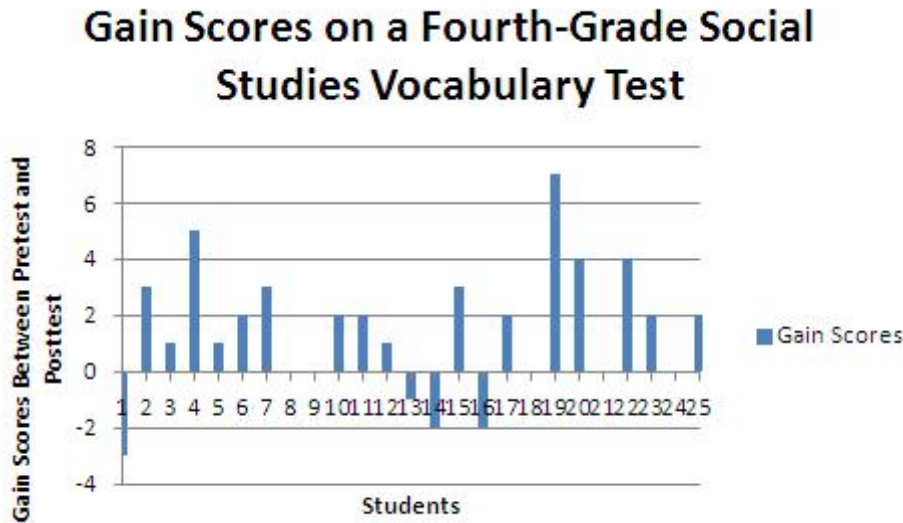

Figure 2. Gain scores for 25 fourth graders on a social studies vocabulary test.

Sixteen students showed an increase in scores from pretest to posttest. Unfortunately, four students showed a decrease in scores from pretest to posttest. Five students showed no change from pretest to posttest, but one student had a perfect score on both the pretest and the posttest. One girl showed a decrease in score from pretest to posttest, four girls had no change in their scores, and seven girls increased their scores from pretest to posttest. Three boys had decreased scores from pretest to posttest. Three boys had no change from pretest to posttest, and seven boys increased their scores from pretest to posttest. When considering students who receive special education scores, one student increased, one student had no change, and two students decreased their scores from pretest to posttest.

Figure 3 shows the pretest and posttest scores disaggregated by word studied.

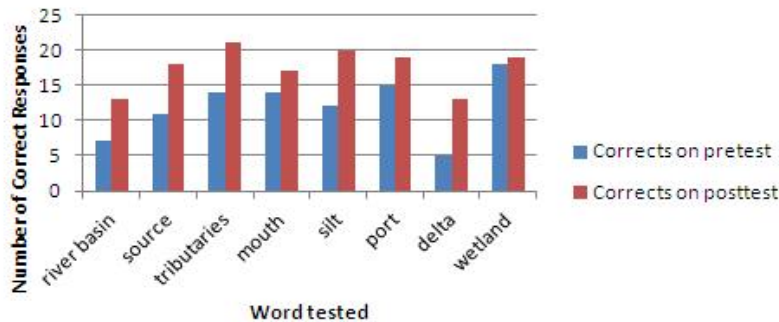**Number of Correct Responses by Word on Pretest and Posttest**

Figure 3. Correct responses by word on a fourth grade social studies vocabulary pretest and posttest.

Each word studied showed an increase in correct responses from pretest to posttest. The four words identified for instruction using the Frayer model (river basin, source, silt, and delta) had the lowest number of correct responses on the pretest, ranging from 5 corrects on "delta" to 12 corrects on "silt". The number of correct responses on the posttest for these four words ranged from 13 correct on "delta" and "river basin" to 20 correct on "silt".

Figure 4 shows the gain scores by word studied on a pretest and posttest of fourth grade social studies vocabulary words.

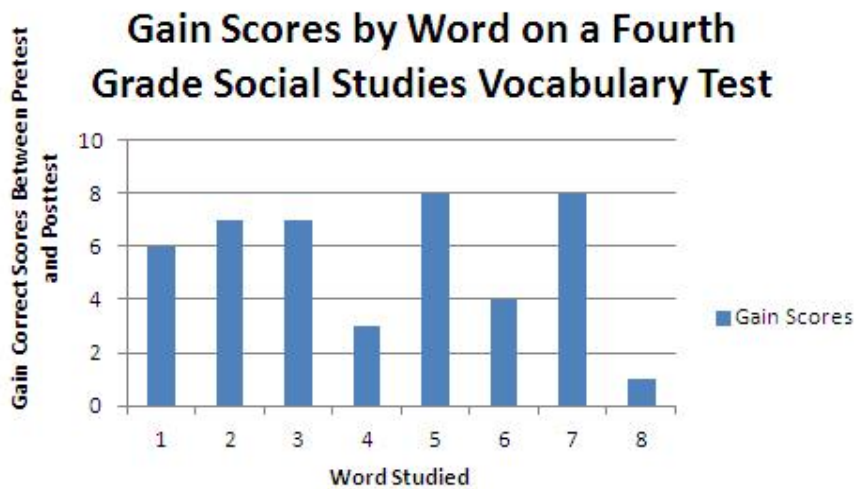**Gain Scores by Word on a Fourth Grade Social Studies Vocabulary Test**

Figure 4. Gain scores by word studied on a fourth grade social studies vocabulary test.

Each word studied showed an increase in correct responses from pretest to posttest. The four words that were targeted for instruction with the Frayer model (words 1, 2, 5, and 7) showed gains in correct responses, with gains ranging from 6 to 8 more corrects from pretest to posttest.

Discussion

       Teacher-selected vocabulary strategy. According to test scores, the instruction for this set of Native American vocabulary words as provided was not necessarily needed and not effective. Many students (fourteen) showed no change from pretest to posttest, although eleven of those students had a perfect score on both pretest and posttest. One student who had a perfect score on the pretest actually scored lower on the posttest. Some students did make gains, with six students scoring one or two points higher on the posttest than they did on the pretest. Unfortunately, almost as many students scored lower on the posttest than they did on the pretest.

       The small group instruction through the week was perhaps ineffective because individual students were asked to create a vocabulary frame for only one of the vocabulary words, and the words were randomly assigned. The instruction would have been more effective to isolate the words that most students were having trouble with and focusing on just those words. If this method is used to teach again, pretest data will need to be examined to decide which words need instruction and which students could most benefit from the instruction. Each student should also be responsible for making a frame for more than one word, perhaps working with a partner to create a frame for each of the targeted words.

       According to this brief study, using vocabulary frames for instruction was not an effective strategy for the chosen words with this group of fourth graders. Vocabulary instruction will need to be modified to find a more effective way to present words for study.

       Discussion for the research-based vocabulary study. After examining the results of the pretest and posttest for the social studies vocabulary words, it seems that the instruction using the Frayer model was effective for this class of fourth graders. The majority of the class (sixteen) scored better on the posttest than they did on the pretest. Five students had no change from pretest to posttest, although one of those scores was a student who had a perfect score on both pretest and posttest. Four students had scores that decreased from pretest to posttest. Two of those students were students who receive special education services. Those two students were absent from the classroom during some of the instruction time in using the Frayer model, because they were receiving their pull-out services for special education. The other two students whose scores decreased actually sit next to one another in the classroom, and their scores were identical on both pretest and posttest, indicating that they may have looked at each other's tests.

       Upon examination of the data disaggregated by word studied, it was evident that the Frayer model was an effective strategy for teaching vocabulary because the words that were targeted for use with the Frayer model showed gains in correct responses when the posttest was compared to the pretest.

       In future use of this strategy, the Frayer model for instruction will be used with most or all of the words selected for vocabulary instruction. Students will be encouraged to use their completed Frayer models as study guides before testing. Additionally, completed Frayer models on the backs of word cards on a word wall can be used to increase understanding of vocabulary words in other subject areas.

The research data generated in this fourth grade classroom corresponds with what is found in the literature regarding the Frayer model for vocabulary instruction: that it is an effective way to provide instruction in vocabulary by integrating both visual and discussion components in the teaching of unfamiliar words (Monroe & Pendergrass, 1997).

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Appendix A

Pretest/Posttest for the Teacher-selected Vocabulary Strategy

Name_____
Write a word from the word box next to each definition.

powwow	igloo	parka	totem
moccasins	tepee	kayak	papaya

_____ an Inuit or Eskimo house or hut shaped like a dome
_____an Inuit or Eskimo canoe made of skins stretched over a light, wooden frame
_____an animal, plant or other natural object that is the symbol of a clan
_____a council or meeting with or of Native Americans
_____ a cone-shaped tent of skins or bark used by some Native Americans
_____the large, sweet, melon-like yellow fruit of a tropical American tree
_____a warm jacket with a hood
_____a soft leather slipper or shoe without a heel

Appendix B

Lesson Plans for the Teacher-selected Strategy for Teaching Vocabulary

Day one: Students will take a pretest over the selected vocabulary words, matching the words with their definitions.

Days two through five: Students will work in a small group with a teacher's aide. Each student will be randomly assigned a word from the word list and will fill in the word frame. The student will write down the word, a definition of the word, a sentence using the word, and some antonyms of the word. Additionally, the student will draw a picture illustrating his or her assigned word. The students in the small group will then share their completed word frames with the rest of the small group. Each student from the class will attend a small group on one day in this time period.

Day four: Students will participate in a whole-class lesson using the selected vocabulary words. The teacher will engage the students in matching the words with their definitions.

Day five: The students will take a posttest over the selected vocabulary words. The posttest will be identical to the pretest.

Appendix C

Pretest/Posttest for the Research-based Vocabulary Strategy

Match the words from the word bank with the correct definitions.

silt	source	wetland
mouth		
tributaries	delta	river basin
port		

_____ all the land that is drained by a river and the river's tributaries
_____ starting point of a river
_____ smaller rivers that feed into a large river
_____ place where a river empties into the ocean or another large body of
water
_____ fine soil
_____ a place where ships load and unload their goods
_____ the land formed by the soil a river deposits as it flows into the sea
_____ a wet area such as a swamp or marsh

Appendix D

Lesson Plans for the Research-based Strategy for Teaching Vocabulary

Day one: Students will take a pretest over the selected vocabulary words, matching the words with their definitions.

Days two and three: Students will be provided a blank Frayer model template to complete for each of the targeted words for study. The teacher will direct the students in completing the templates to include the word, a definition, characteristics or attributes of the word, examples of the word, and non-examples of the word. Students will use their prior knowledge and their textbook to find examples, attributes, and definitions.

Day four: Students will participate in a whole-class lesson. The students will read a section of their Social Studies textbook which uses the targeted words in context. Students will be encouraged to refer to their completed Frayer models to review the meanings of the targeted words.

Day five: The students will take a posttest over the selected vocabulary words. The posttest will be identical to the pretest.