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Research *(cont.)*

What Is Academic Vocabulary?

Some educators differentiate between general academic vocabulary and specialized content vocabulary when discussing academic vocabulary. What is the difference? Yopp, Yopp, and Bishop (2009) have developed definitions for each category. *General academic vocabulary* includes high-utility words found across content areas. These words are those that students will likely find throughout their academic reading and writing experiences and use in academic speech. Words such as *features*, *attributes*, *principle*, *perspective*, *compatible*, and *influence* are examples of general academic vocabulary. *Specialized content vocabulary* includes words that are specific to a particular content area and represent important concepts or ideas for students to learn. Examples of specialized content vocabulary include *democracy* (social studies), *forensic* (science), *numerator* (mathematics), and *protagonist* (language arts). In this notebook, all specialized content vocabulary is related to mathematics topics that are covered in grades 1–8. Students will learn specialized content words such as *fraction*, *congruent*, *estimate*, and *algorithm*. Specialized content vocabulary is considered a part of academic vocabulary.

Why Teach Academic Vocabulary?

Yopp, Yopp, and Bishop (2009) have synthesized the importance of teaching academic vocabulary. Educators and educational researchers have known for years that vocabulary knowledge plays a significant role in reading comprehension. Reading involves making sense of written language. In order to read successfully, we need to understand the words the author has chosen to use. A large body of research confirms that vocabulary knowledge is positively related to a student's ability to comprehend text (Lehr, Osborn, and Hiebert 2004). Although much remains to be learned, the relationship between word knowledge and comprehension is unequivocal. Further, there is evidence that instruction in vocabulary positively affects reading comprehension (Baumann, Kame'enui, and Ash 2003).

Vocabulary knowledge is clearly crucial for success in reading. However, its influence does not stop with reading. Vocabulary knowledge also plays a significant role in overall academic success (Lehr, Osborn, and Hiebert 2004). Students' knowledge of words impacts their achievement in all areas of the curriculum because words are necessary for communicating the content. As classroom teachers know, students have difficulty understanding and expressing the concepts and principles of the content areas if they do not know the specialized vocabulary that represents those concepts and principles.

Indeed, Marzano (2004) maintains that there is a strong relationship between vocabulary knowledge and background knowledge. Therefore, by building students' vocabulary, we can increase their background knowledge, thereby providing more opportunities for learning new concepts.

Keyword Method

Standards

Grades 1–2 (McREL Language Arts Standard 8.5)

Grades 3–5 (McREL Language Arts Standard 8.6)

Grades 6–8 (McREL Language Arts Standard 8.5)

Background Information

What Is It?

The Keyword Method (Baker, Simmons, and Kame'enui 1995) is a strategy that helps students learn and remember word meanings for new vocabulary words. Students learn to associate a new mathematics word with a familiar word and a related visual image. For example, for the term *square number*, which means the product of a number multiplied by itself, the keyword *square* might be used to have students consider the image of a number inside of a square.

When Do I Use It? Why Do I Use It?

The Keyword Method should be used before a lesson or unit as a strategy for relating visual images to specialized content or general academic words. This strategy encourages students to use their oral language to discuss ideas about new vocabulary with their peers and to share connections they have made about words. In addition, students see alternate ways that classmates represent vocabulary visually, which provides them with multiple images on which to rely as they develop an understanding of new vocabulary.

Materials

- + copies of the Keyword Method resource page (p. 152)
- + drawing materials

Directions for the Teacher

1. Read the strategy steps for your grade span (grades 1–2, grades 3–5, or grades 6–8).
2. Refer to the example provided for your grade span. You may also refer to the examples from other grade spans to see how the strategy can be used with different vocabulary words, grade levels, and units of study.
3. Choose the specialized content and/or general academic word you want to focus on in your mathematics lesson. You can refer to your content standards or textbook as a guide. Or, refer to the appendices for lists of suggested specialized content and general academic words to help you plan your lessons.
4. Teach the strategy as outlined, using the word you have chosen. Refer to the Differentiation section for strategies for meeting the needs of all learners.

Grades 1–2

Unit of Study: Measurement

McREL Mathematics Standard 4.1

Strategy in Action: How Does It Work?

1. Before using this strategy, decide which mathematics vocabulary word to use. You can use a general academic or specialized content word. This should be a word that students are learning for the first time.

In this sample lesson, the teacher selects the following specialized content (SC) word that students will learn during the unit:

SC	<i>width</i>
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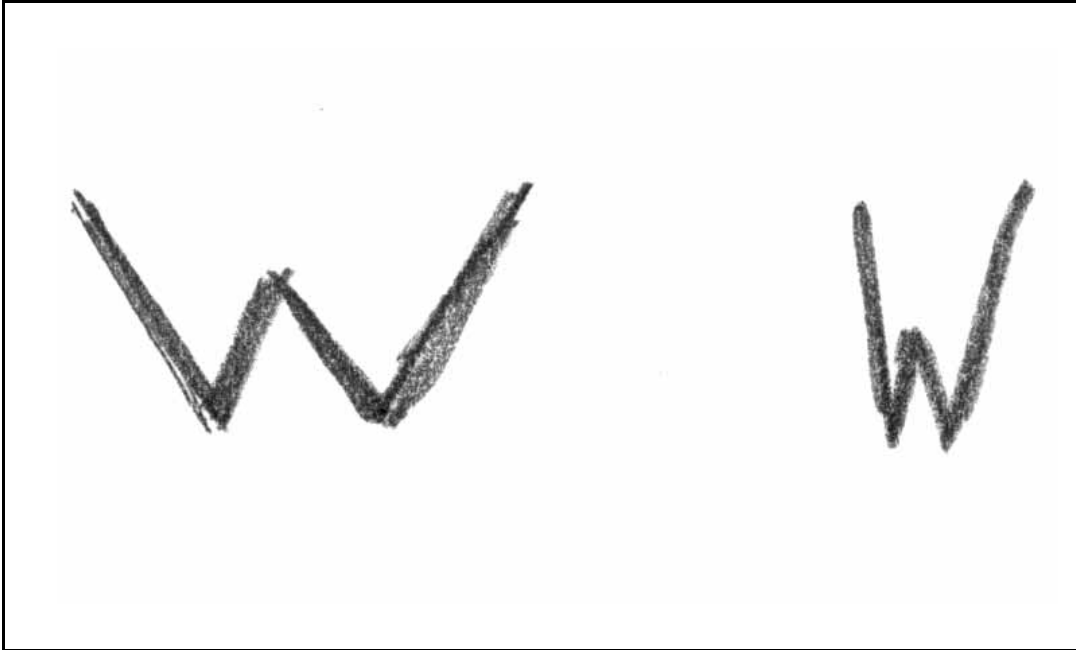
2. To begin the lesson, introduce the vocabulary word to students. Pronounce it aloud and have students repeat your pronunciation. Share the definition of the word. Show pictures, use gestures, or use the word in context.
In this sample lesson, the teacher points to the *pattern* of shapes in the classroom rug.
3. Explain to students that they will create a visual image to help them remember this new word. Model doing this by sharing a familiar vocabulary word and discussing a relevant, visual image with students. Draw a simple sketch of your image while students observe. Talk about the connections you make between the word and the visual image.
In this sample lesson, the teacher chooses to model the word *length*. She draws an object that is very long and another object that is short. She explains that *length* is the measurement of how long an object is. She points out that *length* and *long* both begin with the letter *l* and explains that this helps her remember that *length* is how long something is.
4. Distribute copies of the Keyword Method resource page and drawing materials to students. Ask each student to draw an image that relates to the vocabulary word. Have students label their pictures with the vocabulary word and describe the picture.
5. After students are finished, have them share their work in small groups or with the whole class. Ask each student to share both the image and its connection to the vocabulary word. This strategy allows students to learn more about new words by considering different visuals and the various ways the new words are connected to those visuals.

In this sample lesson, students represent the word *width* in different ways. One student draws a wide *w* and a narrow *w*.

6. In conclusion, have students share how making connections between a vocabulary word and visual images helped them better understand the word.

Example

Vocabulary Word: *width*



Keyword Statement: The letter *w* reminds me that *width* has to do with how wide something is. I drew a wide *w* and a narrow *w* to help me remember what *width* means.

Differentiation

Above-Level Learners

Have students practice this strategy with another vocabulary word. Ask students to draw more than one image for the vocabulary word. Have them share their multiple visual connections to the same word.

English Language Learners

After students draw the visuals associated with the new vocabulary word, have them first share their work in pairs. This gives students an opportunity to discuss vocabulary before sharing their ideas with the whole class.

Below-Level Learners

Assist students as they come up with visuals for new vocabulary. Suggest examples of images for students to consider. Show them examples using books and other reference materials.

Grades 3–5

Unit of Study: Operations

McREL Mathematics Standard 3.7

Strategy in Action: How Does It Work?

1. Before using this strategy, decide which mathematics vocabulary word to use. You can use a general academic or specialized content word. This should be a word that students are learning for the first time.

In this sample lesson, the teacher selects the following specialized content (SC) word that students will learn during the unit:

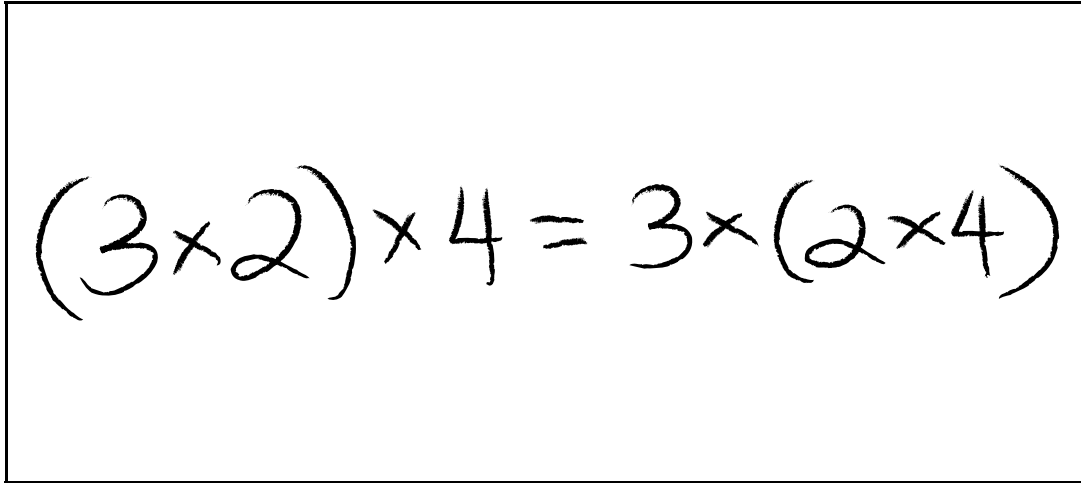
SC	<i>associative property</i>
-----------	-----------------------------

2. To begin the lesson, introduce the vocabulary word to students. Pronounce it and have students repeat your pronunciation. Share the definition of the word. Show pictures, use gestures, or use the word in context.
In this sample lesson, the teacher asks three students to stand in front of the class. He demonstrates that, regardless of how the students are added together, there are always three students standing.
3. Explain to students that they will create a visual image to help them remember this new word. Model doing this by sharing a familiar vocabulary word and discussing a relevant visual image with students. Draw a simple sketch of your image while students observe. Talk about the connections you make between the word and the visual image.
In this sample lesson, the teacher chooses to model the word *face*. She draws a cube and decorates each face of the cube with facial features.
4. Distribute copies of the Keyword Method resource page and drawing materials to students. Ask each student to draw an image that relates to the vocabulary word. Have students label their pictures with the vocabulary word and write a description of the visual image.
5. After students are finished, have them share their work in small groups or with the whole class. Ask each student to share both the image and its connection to the vocabulary word. This strategy allows students to learn more about new words by considering different visuals and the various ways that the new words are connected to those visuals.
In this sample lesson, students represent the term *associative property* in different ways. One student draws three groups of cats, with various numbers of cats in each group. He labels the picture $(2 + 3) + 4 = 2 + (3 + 4)$. Another student writes the following number sentence: $(3 \times 2) \times 4 = 3 \times (2 \times 4)$.

6. In conclusion, have students share how making connections between a vocabulary word and visual images helped them better understand the word.

Example

Vocabulary Word: *associative property*


$$(3 \times 2) \times 4 = 3 \times (2 \times 4)$$

Keyword Statement: The *associative property* explains how numbers associate with each other. The numbers in parentheses are associated with one another. This reminds me that an operation must be performed for those numbers in parentheses before other operations.

Differentiation

Above-Level Learners

Have students practice this strategy with another vocabulary word. Ask students to draw more than one image for the vocabulary word. Have them write about their multiple visual connections for that word.

English Language Learners

After students draw the visuals associated with the new vocabulary word, have them first share their work in pairs. This gives students an opportunity to discuss vocabulary before sharing their ideas with the whole class.

Below-Level Learners

Assist students as they come up with visuals for new vocabulary. Suggest examples of images for students to consider. Show them examples using books and other reference materials.

Grades 6–8

Unit of Study: Data Analysis

McREL Mathematics Standard 6.4

Strategy in Action: How Does It Work?

1. Before using this strategy, decide which mathematics vocabulary word to use. You can use a general academic or specialized content word. This should be a word that students are learning for the first time.

In this sample lesson, the teacher selects the following specialized content (SC) word that students will learn during the unit:

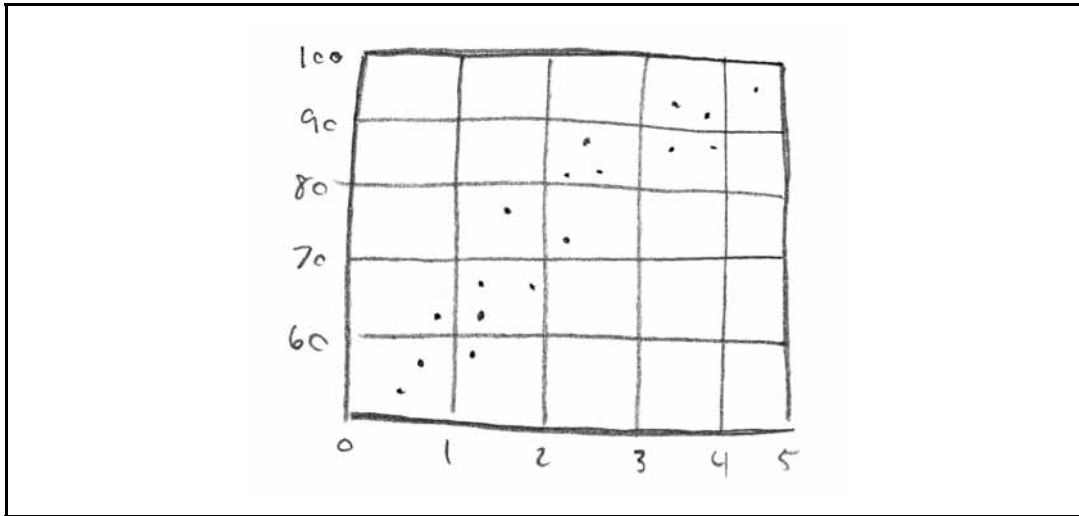
SC	<i>scatter plot</i>
-----------	---------------------

2. To begin the lesson, introduce the vocabulary word to students. Pronounce it and have students repeat your pronunciation. Share the definition of the word. Show pictures, use gestures, or use the word in context.
In this sample lesson, the teacher shows an example of a *scatter plot* and explains that this kind of display shows data as a collection of points.
3. Explain to students that they will create a visual image to help them remember this new word. Model doing this by sharing a familiar vocabulary word and discussing a relevant visual image with students. Draw a simple sketch of your image while students observe. Talk about the connections you make between the word and the visual image.
In this sample lesson, the teacher chooses to model the word *spreadsheet*. He draws an image of a large sheet that spreads wide and explains that a *spreadsheet* is a way to display numerical data in cells that use formulas to make calculations.
4. Distribute copies of the Keyword Method resource page and drawing materials to students. Ask each student to draw an image that relates to the vocabulary word. Have students label their pictures with the vocabulary word and a description of the visual image.
5. After students are finished, have them share their work in small groups or with the whole class. Ask each student to share both the image and its connection to the vocabulary word. This strategy allows students to learn more about new words by considering different visuals and the various ways that the new words are connected to those visuals.
In this sample lesson, students represent the term *scatter plot* in different ways. One student creates a scatter plot to show data about how long students study for a test and their scores on the test.

6. In conclusion, have students share how making connections between a vocabulary word and visual images helped them better understand the word.

Example

Vocabulary Word: *scatter plot*



Keyword Statement: A *scatter plot* is a way to display values for two variables for a set of data. This picture looks like bits of rice scattered on the kitchen floor. This reminds me that the data on a *scatter plot* is scattered on the grid.

Differentiation

Above-Level Learners

Have students practice this strategy with another vocabulary word. Ask students to draw more than one image for the vocabulary word. Have them write about their multiple visual connections for that word.

English Language Learners

After students draw the visuals associated with the new vocabulary word, have them first share their work in pairs. This gives students an opportunity to discuss vocabulary before sharing their ideas with the whole class.

Below-Level Learners

Assist students as they come up with visuals for new vocabulary. Suggest examples of images for students to consider. Show them examples using books and other reference materials.

Name: _____

Keyword Method

Directions: Write the vocabulary word below. In the box, draw a picture that shows the meaning of the word. At the bottom of the page, describe how the picture represents the word.

Vocabulary Word: _____



Keyword Statement: _____

Personal Examples

Background Information

What Is It?

The Personal Examples assessment asks students to connect what they know about learned vocabulary words with their own personal experiences and backgrounds. These connections show the level of students' vocabulary knowledge. This format also requires students to show deeper and more comprehensive knowledge of a new word because they need to apply their knowledge of the word to a context that may be new or different from what was discussed in class.

How Do I Use It Effectively?

It is important to create personal example prompts that encourage students to create these connections. This method of assessment can be used with both specialized content and general academic vocabulary words.

How Do I Use the Resource Page?

On the Personal Examples resource page (p. 2), fill in the vocabulary words and create personal example prompts. The resource page is available as a Word document on the Teacher Resource CD. It can be modified to meet the needs of your students. You may wish to use the following sentence starters to create your assessment prompts:

- Describe a place/an event/an example/a person...
- When/Who/What/How/Why might you...
- Who/What is someone/something you might describe as...
- Name a place/an event you might describe as...
- Share a time when you might/were...

Examples

Grades 1–2 Example

Prompt: Tell about a time when you used a *thermometer*.

Personal example: I used a *thermometer* when I was sick last week.

Grades 3–5 Example

Prompt: Describe a time when a *prediction* came true.

Personal example: Yesterday, I predicted that it would rain before lunch because I saw dark clouds, and my *prediction* came true.

Grades 6–8 Example

Prompt: When might you hear or use the word *range* with your family at home?

Personal example: I used the word *range* to describe the different ages of my family members. My dad is the oldest, and he's 40. My baby brother is two years old. The age range in my family is 38 years.

Name: _____

Personal Examples

Directions: Read each prompt. Then write a personal example for your response.

1. Prompt: _____

Personal example: _____

2. Prompt: _____

Personal example: _____

3. Prompt: _____

Personal example: _____

4. Prompt: _____

Personal example: _____

5. Prompt: _____

Personal example: _____
