

Strategy

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Semantic Mapping

Developing Robust Academic Vocabularies

STRATEGY OVERVIEW

Semantic maps are graphic displays of word meanings that offer students a visual representation of how words and concepts are related through a network of organized knowledge (Heimlich & Pittelman, 1986). The real architects of word maps are the students who use their prior knowledge to deepen their understanding of the topic that results in graphic representations of the relationships and associations of meanings or concepts to the target word (Schwartz & Raphael, 1985). The use of semantic maps as instructional tools provides students with a deepening understanding of words including their concept knowledge, relationships to other words, and multiple meanings.

The semantic mapping strategy is most effective when it is used before, during, and after reading and when the teacher serves as the guide or facilitator to the students who construct their own semantic maps. When semantic mapping is used as a prereading strategy, it helps to activate students' prior knowledge (Heimlich & Pittelman, 1986). Further, the teacher may use the students' prereading semantic maps to determine how much knowledge building is required before students read the text (Antonacci, 1988). When using semantic mapping as a post-reading instructional strategy, teachers employ students' discussions to help them recall and organize information that they have learned from reading text as they make connections to words or concepts related to the topic. Fundamental to the success of the approach is the students' engagement in discussions of word concepts that focus on deepening their knowledge of the academic vocabulary related to content.

When semantic maps were first used to develop word knowledge, they all looked the same. Over the years, we have seen hybrids of the first maps that were used as teachers' purposes for using the graphics developed. For example, word maps may show associations with similar words; they may depict definitions and examples and nonexamples; they may map synonyms and antonyms of target words; they may present the hierarchical relationships to other words; or they may simply present free associations of words to the underlying meaning of the topic. Semantic maps are most effective when (1) they are used with teacher-guided discussion before, during, and after reading a text; (2) teachers select a few critical key words to be taught; and (3) students are actively engaged in constructing their word maps through participating in lively discussions on the conceptual nature of words.

Source: National Governors Association
Center for Best Practices (NGA Center) &
Council of Chief State School Officers
(CCSSO), 2010.

Common Core State Standards: English Language Arts College and Career Readiness Anchor Standards for Language

CCSS.ELA-Literacy.CCRA.L.6 Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

STEP-BY-STEP PROCEDURE

Using semantic maps requires full participation by students who are engaged during teacher-directed discussion. Students will be required to use maps before, during, and after reading the text. Therefore, this step-by-step procedure is designed for using semantic maps as a strategy at different phases of reading informational or narrative text.

BEFORE READING

Prior to reading the text, the teacher examines the text to be read and carefully selects the key words to be learned (content or Tier 2 words) that are critical for understanding the text and the lesson.

1. The teacher introduces the selected content words through the use of the semantic word map and guided discussion.
2. Using chart paper, the blackboard, or a software program with a graphics tool, the teacher draws or projects the word map so that it is visible to the students. The teacher writes the topic or main concept in the center of the map.
3. The teacher distributes semantic maps to the students.
4. The teacher begins the prereading discussion, which focuses on the content words. As students respond to concept-related questions, the teacher writes the word and students' meanings and responses on the map and directs students to do the same.
5. When students fail to respond to the concept-related questions, the teacher should offer a contextual definition of the word that facilitates students' understanding of the text.

DURING READING

As students read, they use their semantic maps to add to the meaning of the words.

1. Before directing the students to read the assigned text, the teacher provides a quick review of the key words.
2. The teacher instructs students to add additional information from their readings to clarify the meanings of the key words. She or he encourages the students to note additional words that further explain the ideas from their readings.

3. As students read, the teacher reminds students to write down questions about words that need clarification.

AFTER READING

The teacher engages students in an extended discussion on their readings, focusing on the content words and their meanings.

1. The teacher directs the students to use their semantic maps during the discussion of their reading. She or he engages students in a discussion that further promotes and deepens their understanding of the content words by building on their conceptual knowledge.
2. As students discuss the reading and use the map as their guide, the teacher directs them to clarify the information that they gleaned from their readings.
3. The teacher guides the discussion with questions that will help students to further understand what they have read. As the students respond to the questions, the teacher notes their responses on the large semantic map as they take additional notes on their own maps.

With the variety of semantic maps that may be used to develop word knowledge, the teacher should select the semantic map that is most appropriate for the readings and content words for developing students' word knowledge around different disciplines. For example, the traditional semantic map helps to show relations among words, others are suitable for displaying examples and nonexamples of the word concept, and others may be used to encourage students to make a personal connection to the word. The graphics below are examples of three different types of semantic maps: Figure 1.1, Semantic Map: Using Word Relationships; Figure 1.2, Semantic Map: Synonyms, Antonyms, Examples, and Nonexamples; and Figure 1.3, Semantic Map: Word Connections.

DIFFERENTIATING INSTRUCTION FOR STRIVING READERS

Semantic mapping may be especially helpful in assisting striving readers and writers in developing their academic vocabularies that will lead to their comprehending content area text (Guastello, Beasley, & Sinatra, 2000; Sinatra, Stahl-Gemake, & Berg, 1984). Provide striving readers with additional scaffolding before and during reading. Before reading the text, the teacher should use expanded definitions of key words, definitions that are easier to understand, and those that relate to students' experiential vocabulary. Such definitions serve as scaffolds in helping low-achieving students comprehend content area textbooks. During reading, it is recommended that the teacher assists students who have difficulty in understanding the text and taking notes on their semantic maps.

CONSIDERING THE LANGUAGE NEEDS OF ENGLISH LANGUAGE LEARNERS (ACADEMIC DISCOURSE)

All students bring a wealth of experience to the classroom. The classroom teacher can tap the collective knowledge of her students and help them make specific connections of their personal experiences to the content. This is especially important for ELL students

Figure 1.1 Semantic Map: Using Word Relationships

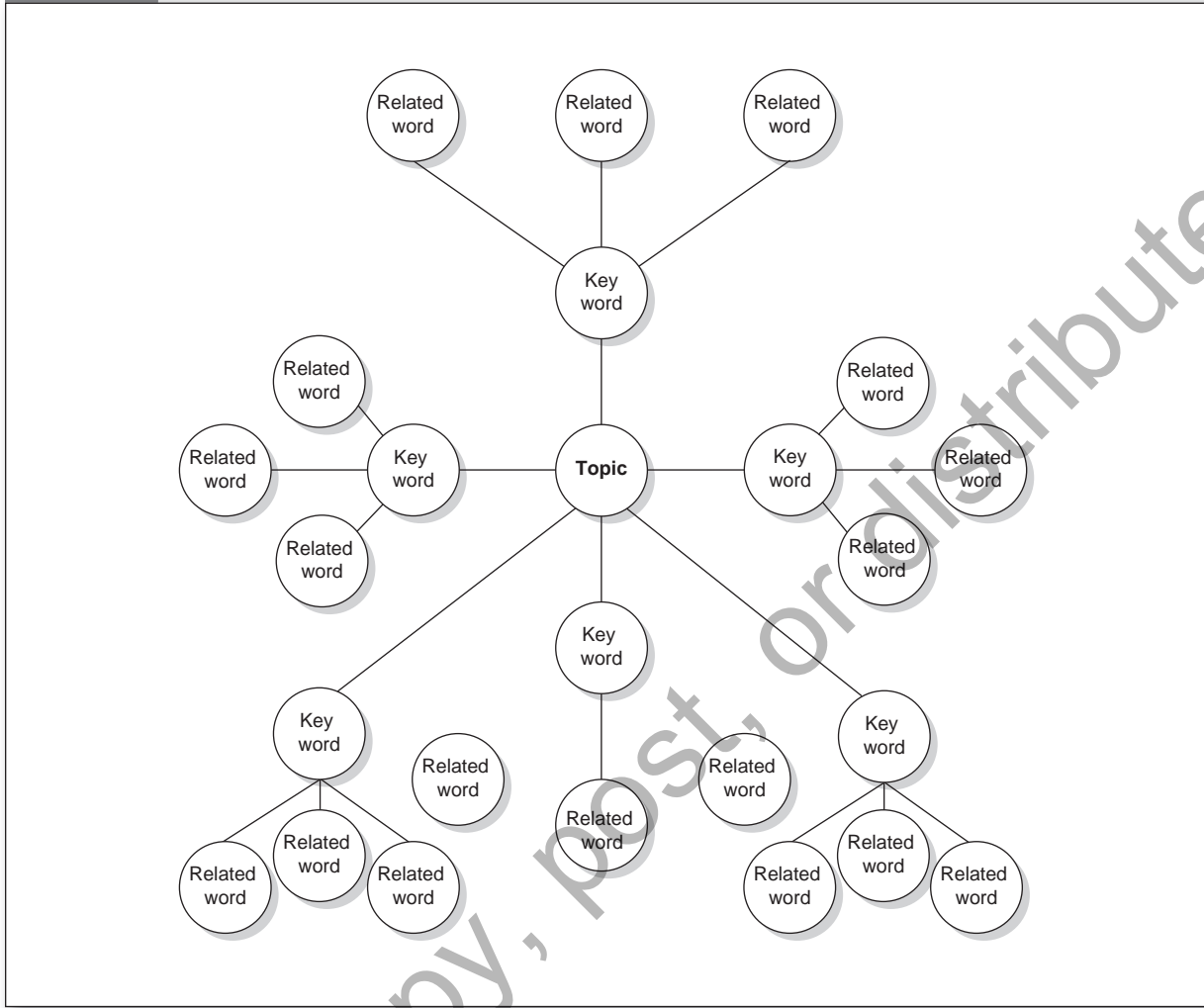


Figure 1.2 Semantic Map: Synonyms, Antonyms, Examples, and Nonexamples

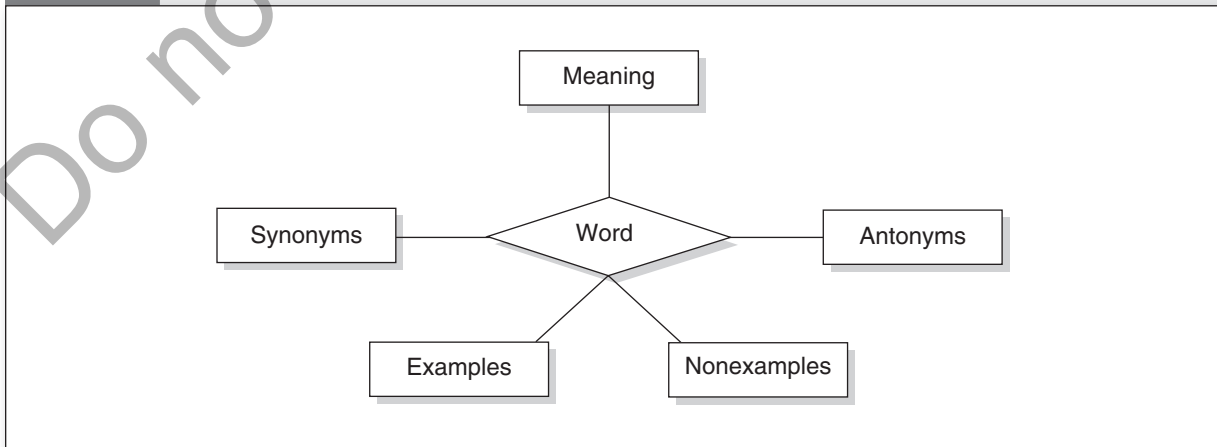
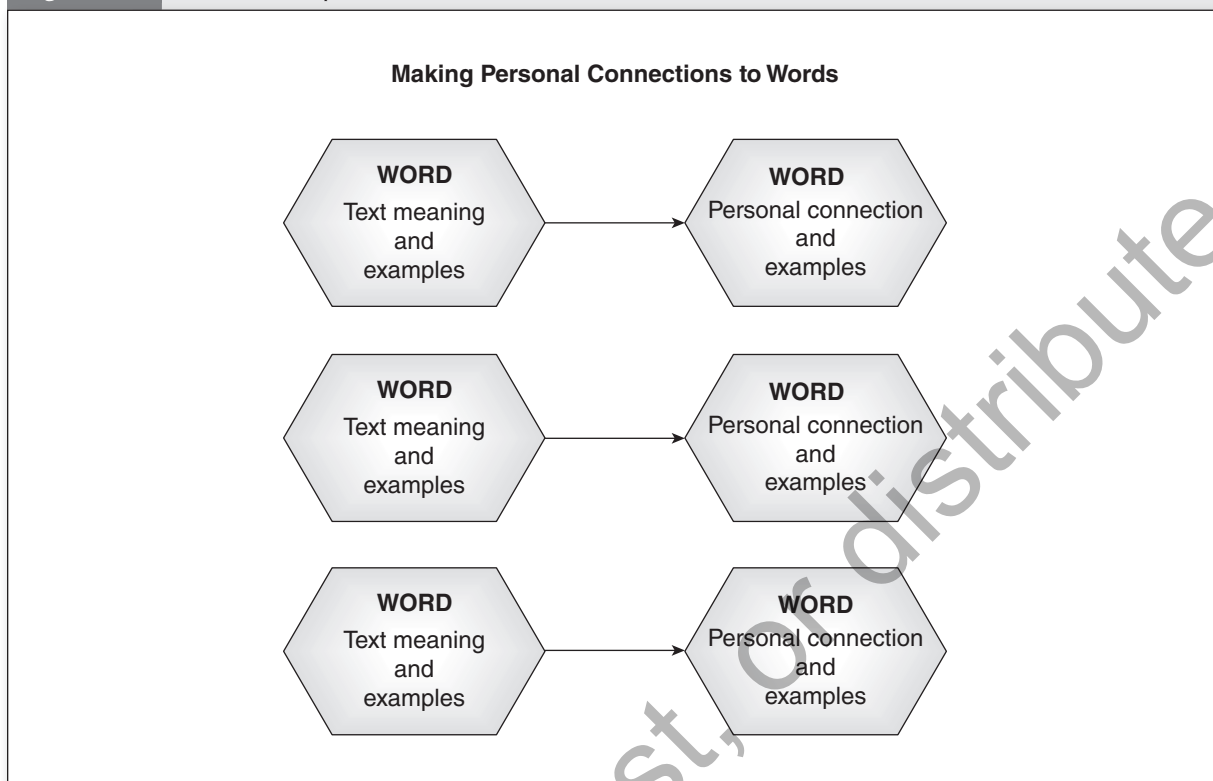


Figure 1.3 Semantic Map: Word Connections



who are building their experiential word knowledge along with their academic vocabularies. For ELL students, building vocabulary by attaching new content words to a broader topic will facilitate their learning of content vocabulary (Au, 1993). Make the connection between students' prior knowledge, content knowledge, and the new key words. Encourage ELLs to provide the word from their native language that matches the key words on the semantic map. Two middle school teachers of ELL students, one in the math classroom and a second in social studies, reported that, when they added a picture cue to each key word on the semantic maps, students found it easier to remember the words and their meanings.

INTEGRATING THE NEW LITERACIES

Vocabulary development requires multiple exposures to the words (Dalton & Grisham, 2011). Information and communication technologies (ICTs) have the potential for teachers to individualize their teaching of vocabulary as well as to encourage collaboration among their students. Various websites provide tools that support vocabulary learning for students individually and with a group. Two free word mapping sites are www.Wordle.net and www.Wordsift.com. Wordle creates a word cloud based on the frequency a word appears in a portion of text. The word cloud encourages thinking about relationships and importance of the words. Examples of word clouds can be found at <http://www.wordle.net/gallery>. Wordsift is similar to Wordle in that text is pasted into a work space and then a word cloud is created. The cloud can be changed in various ways

(e.g., A–Z or common to rare). A visual thesaurus appears alongside the word cloud. The thesaurus is a pop-up that allows for words in the cloud to be defined through a synonym or antonym web. The full version of Visual Thesaurus (<https://www.visualthesaurus.com/>) is also accessible during study of the word cloud.

Two more mind mapping tools are Bubbl.us and Mindomo. These sites have limited free access and require creation of an account (discounts for educators are available). Collaborating is easy to accomplish so that students can work on their maps at home, at school, or anywhere they have computer access. The mind maps synchronize to the computer-based account. To control content on these sites, teachers need to contact their network administrator as these sites have instructions that provide for restricting public access to students' work. Bubbl.us (<https://bubbl.us>) is a brainstorming and mind mapping site that gives teachers and students access to create their own mind maps. In addition, mind maps can be sent by e-mail, embedded in documents, and edited by contacts who have Bubbl.us accounts. Mindomo (mindomo.com) is similar to Bubbl.us but has wider choices to enhance the mind maps (e.g., embedding videos, documents, and images). A fee is required for Mindomo after creation of one mind map or project. An app for Mindomo is available for Android at <http://www.mindomo.com/googleapps/index.htm>.

Popplet (<https://itunes.apple.com/us/app/popplet/id374151636?mt=8>) is a mobile mind mapping app available on iPad and iPhone. Using Popplet requires creation of an account. Popplet lite allows the creation of one mind map, which includes choices of colors for the background and the popple (aka bubble). For a low fee, the full version of Popplet is available so that students can upload videos and images into the mind maps as well as draw their own creation onto a popple. Popplet syncs with the computer version of Popplet and can be shared by e-mail and social sharing sites.

Figure 1.4 Semantic Map: Before Reading

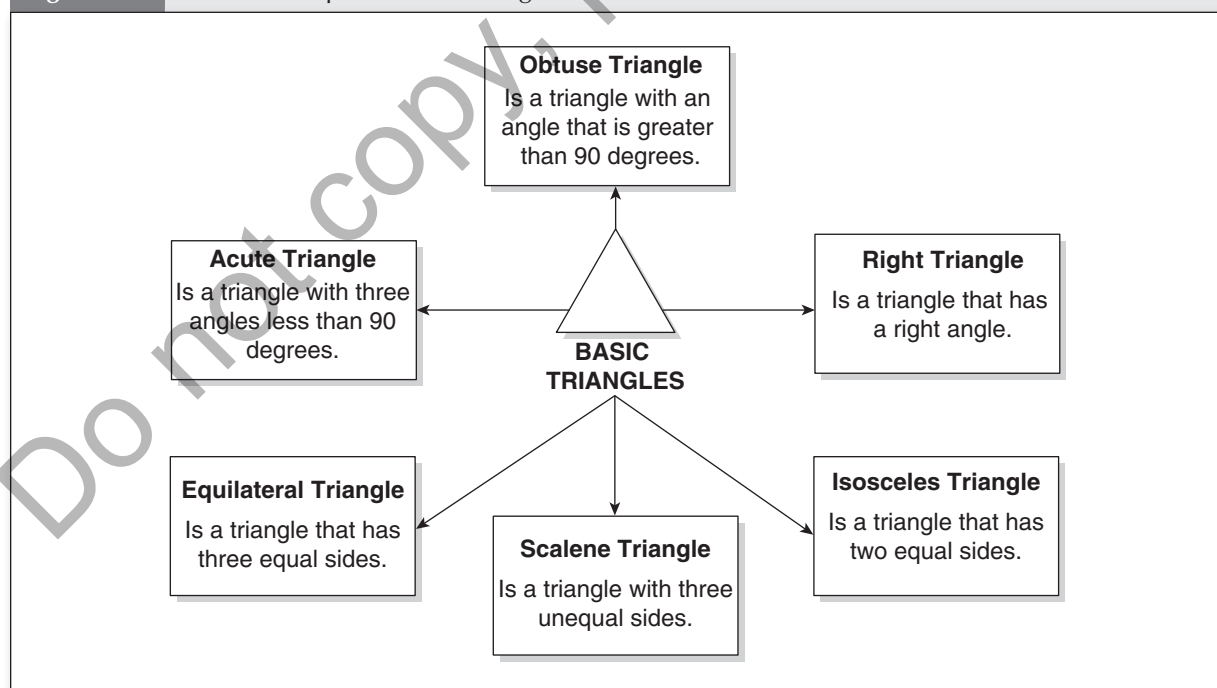
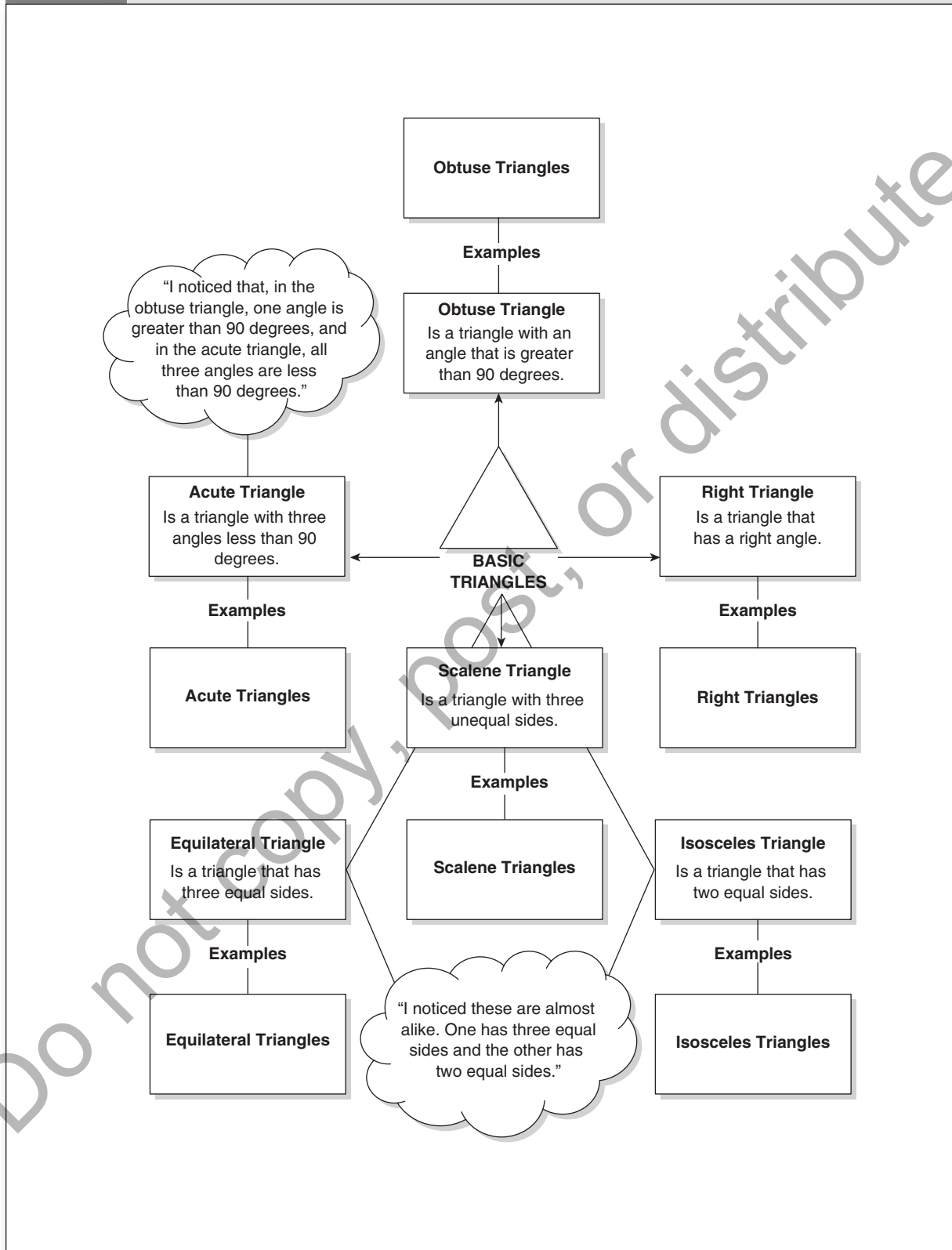


Figure 1.5 Semantic Map: After Reading



AN APPLICATION FOR A MATHEMATICS LEARNING COMMUNITY

In a mathematics class, the teacher prepared the students for an introductory lesson on triangles. The teacher began by introducing the names for four different triangles, showing the semantic map depicted in Figure 1.4, Semantic Map: Before Reading, on an overhead projector or document camera, and giving copies to the students.

The teacher read the names of each of the triangles and asked the students if they knew the definition of each or could describe the properties of the triangles. Many students responded with the definition of the right triangle. The teacher wrote their responses in the appropriate box and continued. Because students did not know the remaining triangles, the teacher provided definitions for each triangle, wrote their meanings on the semantic map, and discussed the properties of the relationships among the triangles. Students were divided into groups of four in order to collaborate for the remaining part of the lesson. As students read their text on the defining characteristics of triangles, they shared ideas and discussed the definitions, took notes, and drew the specific types of triangles onto the semantic maps. After students completed their work in the group, the teacher guided a share session during which the teacher engaged the students in a guided discussion for the purpose of expanding the initial definitions and clarifying any questions. Students shared their definitions and comments and continued to take notes during the discussion, while the teacher recorded their responses on the class semantic map, which could be displayed on the overhead projector, the document camera, or the SMART Board. Figure 1.5, Semantic Map: After Reading, presents the development of word knowledge through reading and discussion.

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