

Vocabulary for
the

COMMON

CORE

Robert J. Marzano

Julia A. Simms



Hawker Brownlow Education



Table of Contents

About the Authors	vii
About Marzano Research.....	ix
Introduction.....	1

PART I

Vocabulary Instruction for the Common Core State Standards.....	3
--	----------

1 The Importance of Vocabulary	5
Vocabulary Development	5
Vocabulary Knowledge	7
The Effects of Vocabulary Instruction	9

2 A Six-Step Process for Vocabulary Instruction.....	13
Step 1: Provide a Description, Explanation, or Example of the New Term	14
Step 2: Ask Students to Restate the Description, Explanation, or Example in Their Own Words	19
Step 3: Ask Students to Construct a Picture, Symbol, or Graphic Representing the Term or Phrase	22
Step 4: Engage Students Periodically in Activities That Help Them Add to Their Knowledge of the Terms in Their Vocabulary Notebooks ..	24
Step 5: Periodically Ask Students to Discuss the Terms With One Another.....	34
Step 6: Involve Students Periodically in Games That Allow Them to Play With Terms	36

3 Vocabulary Terms From the Common Core State Standards	41
Tier 2 Vocabulary From the Common Core State Standards.....	42
Tier 3 Vocabulary From the Common Core State Standards.....	44

4 Building a Vocabulary Program.....	49
Selecting Terms to Teach	49
Creating Systems to Assess and Track Students' Vocabulary Knowledge.....	52

PART II

Tier 2 Vocabulary Terms From the Common Core State Standards	55
Add To (ADD)	57
Arrange (ARR)	57
Collaborate (COLL)	58
Compare/Contrast (C/C)	59
Create (CRE)	61
Decide (DEC)	63
Define (DEF)	63
Elaborate (ELAB)	65
Evaluate (EVAL)	66
Execute (EXEC)	67
Explain (EXP)	68
Hypothesize (HYP)	70
Infer (INF)	72
Measure (MEAS)	72
Problem Solve (PS)	73
Prove/Argue (P/A)	74
Pull Apart (PULL)	76
Redo (REDO)	77
Reference (REF)	78
Seek Information (SI)	79
See the Big Picture (SBP)	81
Symbolize (SYM)	82
Think Metacognitively (TM)	84
Transform (TRANS)	85

PART III

Tier 3 Vocabulary Terms From the Common Core State Standards	89
English Language Arts	91
Reading	91
Reading Foundations	113
Writing	115
Speaking and Listening	127
Language	134
Mathematics	145
Number and Quantity	145
Operations and Algebra	159
Functions	177
Geometry	183
Measurement, Data, Statistics, and Probability	199
<hr style="width: 30%; margin: 10px auto;"/>	
Appendix: Master List of Terms	215
Part II Categories	215
Part III Measurement Topics	215
Terms	219
References and Resources	253
Index	263

Introduction

In 2009, the National Governors Association Center for Best Practices (NGA) and the Council of Chief State School Officers formed the Common Core State Standards Initiative. Their goal was to create a set of statements about what students should know and be able to do as a result of schooling that would be common to all states. Shortly after the Common Core State Standards (CCSS) were released in 2010, forty-five of the fifty states adopted them.

The advent of the CCSS presents educators in the United States with new resources and opportunities, but also with significant challenges. Teachers need to understand the ideas behind the new standards, how they differ from their state's previous standards, and how to implement them in their classrooms. To help educators address these challenges, researchers at Marzano Research sought to develop tools and strategies that educators could use to successfully implement the CCSS in their classrooms and schools. As they analyzed the CCSS and talked to teachers across the United States, they realized that vocabulary instruction was an important area of need. The CCSS prioritize students' acquisition of a wide range of academic and domain-specific vocabulary, and educators needed research-based strategies and processes that would help them implement CCSS-aligned vocabulary instruction in their classrooms and schools. This book was written to meet that need. Other tools and resources for the CCSS are available in the book *Using Common Core Standards to Enhance Classroom Instruction and Assessment* (Marzano, Yanoski, Hoegh, & Simms, 2013) and online at marzanoresearch.com/commoncore.

A book that focuses exclusively on vocabulary is not common among the many (otherwise very useful) books that have already been written about how to implement the CCSS. Previous books have focused on the history and organization of the CCSS (Kendall, 2011; Reeves et al., 2011; Rothman, 2011), thinking skills within the CCSS (Bellanca, Fogarty, & Pete, 2012), assessments and the CCSS (Daggett, Gendron, & Heller, 2010), using the CCSS within existing instructional frameworks (Burriss & Garrity, 2012; Crawford, 2012), and leading implementation of the CCSS (Dunkle, 2012). Others have offered curriculum maps for the CCSS (Common Core, 2012a, 2012b, 2012c) and strategies for achieving success with the CCSS (Silver, Dewing, & Perini, 2012). This omission is unfortunate, since the CCSS present unique demands on the breadth and depth of students' vocabulary knowledge and, in turn, on the instructional techniques teachers must employ in their classrooms. For instance, while students must acquire an attitude of exploration and curiosity toward new words, teachers must identify a manageable number of CCSS vocabulary terms for direct instruction; help students understand, internalize, remember, and use those terms; and assess and track students' progress with the terms. This book was written to address those challenges.

The book includes three parts. Part I contains chapters 1–4. In chapter 1, we explain the importance of vocabulary knowledge and instruction, factors that affect students' vocabulary development, how vocabulary influences students' reading ability and achievement in school, and the research supporting direct vocabulary instruction as an effective strategy for increasing students' vocabulary knowledge. Chapter 2 presents a six-step, research-based process for vocabulary instruction that guides teachers as they introduce and explain new terms and prompt students to create descriptions and graphic representations for terms, interact and play with terms, and refine their understanding of terms. In chapter 3,

we describe the process we used to identify and organize two types of vocabulary terms from the CCSS: academic terms and domain-specific terms. Finally, chapter 4 explains how to build a classroom, school, or district vocabulary program and how to assess and track students' vocabulary knowledge.

Part II contains the academic terms (in this case, cognitive verbs) that we identified from the CCSS, organized into twenty-four categories. These verbs describe how students should interact with the knowledge and skills they learn in class.

Part III contains the domain-specific English language arts (ELA) and math terms that we identified from the CCSS, organized into 116 measurement topics (groups of related words that can be taught together).

The appendix lists all academic and domain-specific terms alphabetically with identifiers so readers can easily find specific words.

© Hawker Brownlow Education

The Importance of Vocabulary

Students' vocabulary knowledge is directly tied to their success in school. This is partly because vocabulary is an important aspect of reading comprehension (Cunningham & Stanovich, 1997; Hattie, 2009; National Reading Panel, 2000; Petty, Herold, & Stoll, 1967; Scarborough, 2001; Stahl, 1999; Stahl & Nagy, 2006) and reading is an important part of learning in school. However, vocabulary knowledge helps students in other ways as well. Knowing what words mean and how they interconnect creates networks of knowledge that allow students to connect new information to previously learned information. These networks of knowledge are commonly referred to as *prior knowledge* or *background knowledge* (Marzano, 2004). Studies have shown that students with greater background knowledge about a topic learn more, remember more, and are more interested when that topic is taught than those who have less initial background knowledge (Alexander, Kulikowich, & Schulze, 1994; Dochy, Segers, & Buehl, 1999; Tobias, 1994). For example, a student learning to measure temperatures would benefit greatly from previous experience with terms such as *Fahrenheit*, *Celsius*, *degree*, *positive number*, *negative number*, or *number line*. A student learning to write argumentative pieces would probably understand the task and purpose better if he or she had even a rudimentary understanding of terms such as *claim* and *support*. Conversely, a student who has never heard these terms and has no experiences associated with them may require more time and effort to understand their meanings and the concepts they signify.

Vocabulary Development

The creators of the Common Core State Standards (CCSS) explained that children initially develop their vocabularies through oral conversations, wherein context clues and background knowledge can help them determine word meanings:

Such conversations are context rich in ways that aid in vocabulary acquisition: in discussions, a small set of words (accompanied by gesture and intonation) is used with great frequency to talk about a narrow range of situations children are exposed to on a day-to-day basis. (NGA & CCSSO, 2010a, p. 32)

For example, most children can easily identify different parts of their face and body at a young age because their parents spend lots of time asking them where their nose, mouth, ears, hands, and feet are, using gestures to help them associate words with parts, and praising them ("That's right! Good for you!") when the child identifies the correct part. However, not all children have equal exposure to the same quantity and kinds of rich oral conversations necessary for early vocabulary development.

The critical role of oral conversation in the development of vocabulary was brought into sharp relief by the research of Betty Hart and Todd Risley (1995). In the late 1980s and early 1990s, they conducted a study designed to observe forty-two young children and their families in their homes at regular intervals over the course of two and a half years (beginning at age one and concluding when the children were three or four). They concluded that “what parents said and did with their children in the first 3 years of language learning had an enormous impact on how much language their children learned and used” (Hart & Risley, 1995, p. 159). Although they found that the quality of the talk that went on in households at all socioeconomic status (SES) levels was about the same, children in higher socioeconomic families simply experienced *more* talk, as shown in table 1.1. Hart and Risley also found a correlation between children’s vocabulary size and their IQ scores.

Table 1.1: Correlations Between Socioeconomic Status, Talk, Vocabulary Size, and IQ Score

	Professional Families	Working-Class Families	Welfare Families
Parent Utterances Per Hour	487	301	176
Child's Recorded Vocabulary Size	1,116	749	525
IQ Score at Age 3	117	107	79

Source: Adapted from Hart & Risley, 1995, p. 176.

As shown in table 1.1, children whose parents talked to them more began preschool and kindergarten with larger vocabularies and higher IQ scores than children whose parents talked to them less. In 2003, Hart and Risley published “The Early Catastrophe: The 30 Million Word Gap by Age 3.” In that article, they used their 1995 data, along with further data collected on the same children in the years since the original study, to extrapolate that in the first four years of life, “an average child in a professional family would accumulate experience with almost 45 million words, an average child in a working-class family 26 million words, and an average child in a welfare family 13 million words” (p. 9). The eponymous 30 million word gap between children in professional families and children in welfare families highlights the powerful role that socioeconomic status plays in vocabulary development.

Although not as extensive as Hart and Risley’s work, Erika Hoff’s 2003 study of over sixty high- and middle-SES children’s interactions with their mothers found similar results. However, she also highlighted the fact that children in higher SES families not only hear more words, but they also have more language-learning experiences around which to interact. She stated that “aspects of experience that support vocabulary acquisition are not equally available to children across socioeconomic strata” (p. 1375). When considered together, Hart and Risley’s (1995, 2003) and Hoff’s (2003) research paint a worrying picture of the vocabulary challenges that lower-SES students face.

Vocabulary progresses in rather predictable ways beyond oral conversation. For example, students develop vocabulary associated with their interests. Jill Castek, Bridget Dalton, and Dana Grisham (2012) explained that in addition to learning vocabulary through interactions with parents, siblings, and other important people in their lives, children learn new vocabulary “as a result of socialization into various communities of practice” (p. 305). A student interested in Greek and Roman mythology will probably develop a larger vocabulary of terms related to that topic than a student interested primarily in cars and motorcycles (who would probably develop rich vocabulary knowledge in that field).

One of the biggest challenges in developing academic vocabulary, like the terms important to the CCSS, is that it might not initially seem related to students' interests. Additionally, many CCSS terms tend to be intangible and not commonly used in everyday interactions. Castek and her colleagues (2012) observed that "learning to use academic language is one of the greatest challenges of schooling because this register tends to be abstract and distant from spoken vocabulary" (p. 305). Explicit descriptions and examples are necessary to help students understand and use many of the academic vocabulary terms critical to their success in school.

Vocabulary Knowledge

In addition to their findings about socioeconomic status and vocabulary, Hart and Risley (1995) found that children with larger vocabularies acquired new words at a faster rate than other children. Andrew Biemiller and Naomi Slonim (Biemiller, 2005, 2012; Biemiller & Slonim, 2001) reported similar research:

By the end of grade 2, children in the lowest vocabulary quartile had acquired slightly more than 1.5 root words a day over 7 years, for a total of about 4,000 root word meanings. In contrast, children in the highest quartile had acquired more than 3 root words a day, for a total of about 8,000 root word meanings. (Biemiller, 2012, p. 34)

According to Loren Marulis and Susan Neuman (2010), a slower rate of learning new words leads to a "cumulative disadvantage over time" (p. 301). Here we review three areas affected by this disadvantage: (1) reading ability, (2) independent reading, and (3) mental processes.

Vocabulary and Reading Ability

The nature of the cumulative disadvantage described by Marulis and Neuman (2010) becomes clear when one considers vocabulary's effects on learning to read and reading comprehension. Michael Kamil and Elfrieda Hiebert (2005) described the process of learning to read as follows:

Beginning reading instruction is typically accomplished by teaching children a set of rules to decode printed words to speech. If the words are present in the child's oral vocabulary, comprehension should occur as the child decodes and monitors the oral representations. However, if the print vocabulary is more complex than the child's oral vocabulary, comprehension will *not* occur. (p. 3)

Students who have large oral vocabularies will recognize and understand more of the words they are asked to decode, which in turn allows them to more fully comprehend the passages they read. The importance of vocabulary knowledge in learning to read was emphasized by the National Reading Panel's (NRP) 2000 report, *Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction*. Concerning vocabulary, the NRP (2000) reported:

Benefits in understanding text by applying letter-sound correspondences to printed material come about only if the target word is in the learner's oral vocabulary. When the word is not in the learner's oral vocabulary, it will not be understood when it occurs in print. *Vocabulary occupies an important middle ground in learning to read. Oral vocabulary is a key to learning to make the transition from oral to written forms.* (ch. 4, p. 3, italics added)

As seen in the NRP's report and echoed by the authors of the CCSS, "the importance of students acquiring a rich and varied vocabulary cannot be overstated" (NGA & CCSSO, 2010a, p. 32).

Vocabulary and Independent Reading

A large vocabulary helps children learn to read; because of the connections between vocabulary and reading comprehension, students with large vocabularies are more successful readers and therefore more likely to read independently than students with smaller vocabularies. Steven Stahl (1999) described how this relationship affects the amount of reading that students do as they progress through school:

Because poor readers tend to read less than better readers, the gap between good and poor readers in absolute numbers of words read becomes progressively greater as the child advances through school. . . . Children who are good readers become better readers because they read more and also more challenging texts, but poor readers get relatively worse because they read less and also less challenging texts. Indeed, researchers have found large differences in the amount of free reading that good and poor readers do in and out of the school. (p. 12)

In other words, students who read well tend to read more, thus improving their vocabularies and reading skills, while students who have trouble reading tend to read less, thus missing opportunities to augment their vocabularies and improve their reading skills through practice. Much additional research supports the correlation between vocabulary level and reading comprehension (for example, Coyne, Capozzoli-Oldham, & Simmons, 2012; Cromley & Azevedo, 2007; Lesaux & Kieffer, 2010; Stahl & Nagy, 2006). In sum, the effects of vocabulary knowledge on reading comprehension and skill are significant and long lasting.

Vocabulary and Mental Processes

Vocabulary is also related to basic mental processes and skills that affect students' overall academic achievement. Katherine Stahl and Steven Stahl (2012) explained that "children's ability to name things establishes their ability to form categories" (p. 72). For example, a student who learns the word *shake* can subsequently attach other words and concepts to it, such as *shiver*, *vibrate*, *wiggle*, *flutter*, *jitter*, and so on. As students develop more complex categorization systems for new words, they are better able to summarize (Kintsch, 1998; Kintsch & van Dijk, 1978) and make inferences (Anderson & Pearson, 1984) about new information. Stahl and Stahl (2012) concluded that "to expand a child's vocabulary is to teach that child to think about the world, and in a reciprocal fashion, [a] more refined vocabulary indicates that child's degree of knowledge about his or her world" (p. 73). Essentially, knowing more words allows students to think about more concepts in more ways.

Researchers have also found that there is a significant correlation between vocabulary and intelligence. Joseph Jenkins, Marcy Stein, and Katherine Wysocki (1984) cited correlations as high as 0.80 between vocabulary and intelligence, and Marzano (2004) summarized similarly high correlations between vocabulary knowledge and intelligence, as shown in table 1.2.

Table 1.2: Correlations Between Vocabulary and Intelligence in Various Studies

Study	Correlation
Terman (1918)	0.91
Mahan and Whitmer (1936)	0.87
Spache (1943)	0.92

Study	Correlation
Elwood (1939)	0.98
McNemar (1942)	0.86
Lewinski (1948)	0.82
Wechsler (1949)	0.78
Raven (1948)	0.93

Source: Marzano, 2004, p. 32.

To interpret the correlations in table 1.2, keep in mind that a perfect positive relationship between two variables is indicated by a correlation of 1.00. As one variable increases, so does the other. Therefore, correlations approaching 1.00 (such as those shown in table 1.2) are considered quite strong.

There are several possible reasons for the correlation between vocabulary and intelligence. First, Stahl (1999) suggested that students who have higher general ability (or intelligence) are simply better at more things, including learning new vocabulary words. Alternatively, Sternberg (1987) postulated that students with higher intelligence learn better from context, and so soak up more words as they encounter various situations. However, it is also possible that students with larger vocabularies can understand more information and therefore analyze information more effectively, thus allowing them to perform better on intelligence tests. A study by Brent Berlin and Paul Kay (1999) illustrates this principle. Berlin and Kay investigated different cultures' perceptions of color. They discovered that some cultures had fewer terms for colors than others. For example, some cultures only had color terms for light and dark; others for light, dark, and red; others for light, dark, red, and green; and so on. The vocabulary for color in a culture's language affected their ability to talk and think about the concept of color. In the same way, it is difficult for a student to think about a concept if he or she doesn't know the word for it. One final explanation for the correlation between vocabulary knowledge and intelligence may have to do with the use of vocabulary-based tasks on intelligence tests. If an intelligence test asks a student to select the appropriate use of a specific word, the student's success with that task is directly related to his or her knowledge of that word. Whatever the reason for the correlation between vocabulary and intelligence, Stahl and Nagy's (2006) statement holds true: "Words divide the world; the more words we have, the more complex ways we can think about the world" (p. 5).

The Effects of Vocabulary Instruction

Given the importance of vocabulary knowledge to academic success, one might assume that vocabulary instruction is of primary importance in most schools. However, Marzano (2004) reported that "uniform and systematic vocabulary instruction is scarce in U.S. schools" (p. 62), citing previous researchers (Durkin, 1979; Roser & Juel, 1982) who found that vocabulary instruction consumed less than one-half of one percent of instructional time in schools. The authors of the CCSS bemoaned the fact that "vocabulary instruction has been neither frequent nor systematic in most schools" (NGA & CCSSO, 2010a, p. 32) and cited a number of research studies (Biemiller, 2001; Durkin, 1979; Lesaux, Kieffer, Faller, & Kelley, 2010; Scott & Nagy, 1997) to support their assertion.