The Fundamentals of Academic Vocabulary
Essential Concepts for Middle School Students and Their Teachers

by Jennifer Wells Greene

The purpose of this article is to describe the vocabulary needs of middle school students, with a focus on academic vocabulary. In the early grades, when students are learning to read, academic vocabulary demands are relatively limited; and generally speaking, if they can recognize grade-level words, they can understand what they have read. This changes when students reach fourth grade and beyond as they are no longer learning to read; instead, students are expected to read to learn. At the same time students are expected to read texts containing a different kind of vocabulary, academic vocabulary, which is a very different sort of vocabulary than the words we use for general communication. For so many students, those in the general education as well as those in special education and ESL contexts, when word recognition declines, so does solid comprehension of their texts. Teachers of middle school students see this difficulty every day in their classrooms and, given their instructional demands, are often at a loss about how to assist their students with academic vocabulary development. This article has three goals. The first is to define and describe academic vocabulary in relation to other kinds of vocabulary. The second is to develop an understanding of why knowledge of academic vocabulary is so important. Finally, help students focus on and develop their knowledge of academic words by providing a description of a balanced framework of learning activities.

What is academic vocabulary and how is it different from other kinds of vocabulary?

Vocabulary researchers have categorized words based upon their frequency of use for specific purposes. A well-known categorization was developed by Beck, McKeown, and Kucan (2002) who conceptualized vocabulary into three tiers. In this conceptualization, Tier 2 words are those that are academic in nature. Coxhead (2000) defined academic words as a type of specialized vocabulary that appears most frequently in written academic text (e.g., textbooks and journal articles) but not very frequently in other kinds of texts or settings (e.g., novels and conversations). Additionally, academic words are often supportive to a topic rather than central to a topic. As an example, consider the words *release* and *contrast*. These words are frequently used in academic textbooks written for university-level students as well as middle school students (Greene & Coxhead, 2015; Coxhead, 2000); however, when we think about how they might be used, it is easy to see how they would support a topic being discussed. Finally, the third part of Coxhead's definition of academic words is that they often come from Greek or Latin roots (e.g., *transport* and *export*).

A second type of specialized vocabulary is referred to as *technical* vocabulary (Nation, 2013). Technical words are those that are specifically used in a particular subject area, and as opposed to academic words, technical words are directly related to the topic discussed. Beck and colleagues (2002) refer to technical words as *Tier 3 words*. Words such as *molecule* and *bacteria* are examples of technical words in middle school science textbooks (Greene & Coxhead, 2015). The following paragraphs describe how academic and technical words are demonstrated in written text.

The paragraph below is from a science textbook written for students in the seventh grade. In this paragraph academic words have been bolded and technical words have been bolded and underlined for easier identification.

> As you grow, you pass through different stages in life. **Similarly**, your **cells** pass through different stages in their life **cycle**. The life **cycle** of a **cell** is known as the **cell cycle**.
>
> The **cell cycle** begins when the **cell** is formed and ends when the **cell** divides and forms new **cells**. Before a **cell** divides it must make a copy of its DNA. DNA contains the information that tells a **cell** how to make **proteins**. The DNA of a **cell** is organized into **structures** called **chromosomes**. In some **organisms**, **chromosomes** also contain **protein**. Copying **chromosomes** ensures that each new **cell** will be able to **survive** (Allen, 2004, p. 92).

Seeing a paragraph constructed in this fashion is helpful for understanding the frequency with which academic and technical words appear in written academic text. The paragraph above contains a total of 106 words, and of these, 24 are academic or technical in nature. The technical word *cell* along with its plural form *cells* occur 11 times throughout this paragraph. The academic word *cycle* occurs four times. In addition to frequency of use, we can also see the differences between words that are strictly academic in nature (e.g., *similarly* and *survive*), which are more supportive in nature as opposed to technical words. This being said, we can also note that the majority of the words in the paragraph above are not bolded or underlined. A discussion of the classification of those words follows in the next paragraph.

The next category of vocabulary researchers have identified is referred to as *high-frequency vocabulary*. The English language contains tens of thousands of words, but a relatively small percentage of these words do the majority of the work (Goulden, Nation, & Read, 1990; Nation, 2008). These are the words that we use over and over again, both in written texts and in conversation. Beck and colleagues (2002) would refer to these

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words as *Tier 1 words*. A well-known list of high-frequency vocabulary is the General Service List (GSL) (West, 1953), which contains about 2,000 word families. West compiled the GSL with the purpose of creating a relatively short list of words that would allow an individual to communicate just about any idea. The GSL is an older list, so it does not contain words like *computer* or *Internet*; however, it has been shown to consistently represent up to 80% of written texts across genres (Nation & Hwang, 1995).

As an example, the following paragraph is taken from *The Hunger Games*, which is a popular fiction novel written for adolescents and young adults. In this paragraph, all of the words on the GSL are bolded.

> **I swing my legs off the bed and slide into my hunting** boots. Supple **leather that has** molded **to my feet**. **I pull on** trousers, **a shirt**, tuck **my long dark** braid **up into a cap**, **and** grab **my** forage **bag**. **On the table, under a wooden bowl to protect it from hungry rats and cats alike, sits a perfect little goat cheese wrapped in** basil **leaves**. Prim's **gift to me on** reaping **day**. **I put the cheese carefully in my pocket as I slip outside** (Collins, S., 2008, page 2).

This paragraph contains 87 words, and of those, 87% are part of the GSL, which is excellent coverage and helps to demonstrate how powerful this list really is. None of the words in this paragraph could be classified as academic or technical in nature, which helps to illustrate one of the features of academic words discussed earlier in this section—they occur in academic texts, but not other kinds of texts. With this understanding, it is easy to see how students who read a great deal of fiction still might have difficulty understanding academic and technical words simply because they may not encounter them in fictional texts.

Beyond high-frequency vocabulary and academic and technical vocabulary there is a categorization of words referred to as *low-frequency vocabulary*, which Beck and colleagues (2002) would refer to as *Tier 3 words* (along with technical words). In the paragraph above, words such as *braid*, *forage*, and *reaping* are all examples of low-frequency vocabulary. The vast majority of words in the English language can be considered low-frequency words, and at the same time they represent the smallest percentage of words in a given text (Nation, 2013).

A final categorization of words is that of proper nouns. In the paragraph above, one of the words not found on the GSL is *Prim*, which is a proper noun. Although proper nouns have not traditionally been categorized as academic or technical words, they certainly can be. As an example, history and social studies textbooks contain many proper nouns (e.g., names of people and places) that students are required to know. For this reason, it is important to consider them when thinking about the vocabulary that middle school students need to know (Kobeleva, 2008; Erten & Razi, 2009).

In the preceding section, academic and technical vocabulary have been defined and described in addition to high- and low-frequency vocabulary and proper nouns. Additionally, those words were demonstrated in samples of running text from a science textbook and from popular fiction. The next section of this article is a discussion of the heightened demand for the knowledge of academic language with the Common Core State Standards (CCSS) in mind.

What do the CCSS say about academic language?

There are three significant shifts in learning priorities demonstrated throughout the CCSS (Kapinus, Pimental, & Dean, 2012). These three shifts are as follows: First, the CCSS require students to read more difficult texts at all grade levels and more nonfiction texts than fiction texts. As we can see from the preceding section, nonfiction text contains more academic language than does fiction, so there is an embedded requirement that students have a good control of both academic and technical words. Second, there is an increased focus on what students glean from reading: evidence. Prior to the CCSS, students were taught to build comprehension by making connections between what they read and their personal lives and experiences, which while meaningful, allowed readers to respond to text without demonstrating evidence within the text in their responses. Under the CCSS, students' responses to text must be grounded in evidence from the text(s) read, and academic and technical words must be included in their responses. Finally, the third shift is a requirement that students increase their content-area understandings by synthesizing what they have learned both within and across the content areas. To accomplish this standard, there is a requirement that students complete regular research projects in all content areas and include academic and technical words in their written and oral presentations of that research.

In conclusion, it is clear that today's students, under the demands of the CCSS, will need good control of academic and technical words throughout the reading, writing, speaking, and listening activities related to their coursework. With that big idea in mind, how can teachers and parents assist middle school students in developing their understanding of this new vocabulary? What words should be prioritized? How can we help students focus their attention on learning the meanings of these words? These questions are addressed in the next sections.

What are the priorities for word learning?

Frequency matters when identifying words for study. The first priority for students is a good foundation of high-frequency vocabulary because those words represent the majority of the texts they will read. It can reasonably be expected that a student in middle school would know these words; however, teachers of English learners may want to test their students' high-frequency vocabulary knowledge. There are online tests for the GSL (West, 1953) at Tom Cobb's (n.d.) Compleat Lexical Tutor website (*www.lextutor.ca*) in the

Learners section. Teachers and parents who are interested in seeing the GSL in its entirety can find it on John Bauman's website (*www.jbauman.com*).

Middle school students who have a foundational vocabulary in place are ready to focus their attention on academic and technical words. The Middle School Vocabulary Lists (Greene & Coxhead, 2015) provide frequency-based lists of academic and technical words in the content areas of English grammar and writing, health, mathematics, science, and social studies and history. These lists are derived from a corpus (a collection of authentic texts for the purpose of linguistic research) of content-area textbooks written for middle school students (grades 6, 7, and 8) and when combined with the words on the GSL, represent strong coverage of the texts contained in those textbooks (see Greene & Coxhead, 2015, for detailed information about the development and coverage of these lists).

Students who are working toward university-level study should focus their attention on the Academic Word List (AWL) (Coxhead, 2000). This is a list of 570 word families derived from a corpus of university-level written academic texts (refer to Coxhead, 2000, for detailed information about the development and coverage of this list). The AWL is available online at *http://www.victoria.ac.nz/lals/resources/academicwordlist*

This section has described word-learning priorities for students in middle school and beyond. The next section outlines a plan for balanced vocabulary instruction and offers suggestions for activities to help middle school students focus attention on new words.

How can we provide balanced vocabulary instruction in the middle school classroom?

Paul Nation (2007) describes a framework for balanced instruction in a word-learning classroom. Within this framework, there are four instructional strands: Meaning-focused input (learning vocabulary through reading and listening activities); meaning-focused output (learning vocabulary through speaking and writing activities); language-focused learning (focused on spelling, pronunciation, and grammar of new words); and fluency activities (timed activities during which students are required to use target words during speaking and writing). It is important to remember that instructional time should be evenly divided among these four strands in order to provide rich vocabulary learning opportunities.

Learning New Words through Listening and Reading

Students need to hear academic and technical words repeatedly to assist their understanding of meaning. The difficulty with academic vocabulary is that these words are more often used in academic writing than in fiction or conversation, so students often do not get good exposure to these words. Teachers need to prioritize the use of academic words during instruction and be transparent about their purposes in doing so. Parents of middle school students should also prioritize their use of academic words at home rather than the high-frequency words that are typically used during conversation. In addition to providing students with multiple opportunities to hear academic words, students need multiple opportunities to read academic words in written text.

Three excellent reading activities for reading nonfiction text are jigsaw reading, narrow reading, and close reading. Teachers can easily focus students' attention on academic and technical vocabulary by highlighting target words in the texts students read. *Jigsaw reading* (Slavin, 1996) is a type of split-information activity that requires students to read short texts or parts of a single text and share what they have learned with others, making sure to use target vocabulary during the sharing process. *Narrow reading* (Schmitt, 2000) is an activity during which students read multiple texts written about the same topic, which provides students opportunities to see the same academic and technical words repeated across the texts they are reading. *Close Reading* (Zwiers, O'Hara, & Pritchard, 2014) describes reading activities during which readers read and re-read sections of complex text with specific purposes guiding re-reading events (e.g., gathering evidence and describing the meaning of new words).

Learning New Words through Speaking and Writing

Students need to incorporate academic and technical words throughout their speaking and writing activities. Of course, this task is difficult for students who are learning new words; however, it is such an important aspect of word-learning that teachers and parents need to hold students accountable for doing so. One easy way to do this is to provide the target words your class is working with as part of assignment directions. This way, students can see the words they are expected to include in their spoken and written responses. As an example, if students were responding to the seventh grade science paragraph included earlier in this article, it would be helpful to provide them with a list of target words from that passage in their responses. Suggestions for academic words could be *similar*, *cycle*, *structure*, and *survive*. Technical word suggestions could be *cell*, *protein*, and *chromosome*. Teachers would need to consider their students' strengths and needs when making decisions about how many words they want students to focus on.

Language-Focused Learning Activities

Teachers and parents are most likely familiar with language-focused learning activities because these are the activities that are traditionally used in vocabulary instruction. Some examples of these activities are vocabulary cards, word sorting, word chaining, word-learning journals, and semantic feature analysis. A brief description of each of these vocabulary learning activities can be found in the sections below; please refer to Greene and Coxhead (2015) or the references cited below for in-depth information and detailed instructions about how to use them.

Vocabulary cards (Coxhead, 2006; Nation, 2013) help learners store information about a word's form and use (front of card) and provide information about its meaning (back of card).

Word sorting (Gillett, Temple & Crawford, 2004) allows students to manually sort words into categories. Learners can sort words according to forms, meanings, relationships, or functions. For example, the following words are included on the Middle School Science Vocabulary List (Greene & Coxhead, 2015): *atom*, *element*, *compound*, *molecule*, *symbol*, *carbon*,

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hydrogen, *aluminum*, *oxygen*, *carbon*, *formula*. Possible word sorts include sorting these words by elements/others or sorting them for meaning by explaining how they combine (e.g., *elements* chemically combine to form *compounds*, both *atoms* and *elements* chemically combine to form *molecules*. Science teachers will probably think of numerous other possibilities from just this brief selection of words.

Word chaining (Rasinski, 2006) requires learners to link related words by connecting their forms, meanings, relationships, or functions. Additionally, learners are required to state the reasons behind their connections. As an example, word chaining for form targeting the academic word *create* would look something like the following: Have students write the word *create*. Ask students to identify the part of speech (*create* is a verb). Prompt students to add the letter *d* to the end of *create* and say what word they have now (*created*). Ask them how this word has changed (*it is now a past tense verb*). Have students remove the *d* and add *s* to *create*. Prompt students to say the new word (*creates*). Ask students how this has changed the target word *(it is now a third person singular verb)*. Now, ask students to remove the –es and add –*tion*. What word do they have now? (*creation*). How does this change the word? (*Now it is a noun.)* This process can continue with any appropriate prefixes or suffixes for any given target word.

Word-learning journals (Berthoff, 1981) help students focus on learning new words. Typically, these journals ask students to name the target word, include the word in a sentence from a text, and write their thoughts about the target word's meaning and potential use.

Semantic feature analysis (Anders & Bos, 1986) allows students to compare and contrast features of words that share close forms, meanings, or functions (e.g., *affect* and *effect*; *elements*, *compounds*, and *molecules*).

Language-focused learning activities like those described above can be found in just about any vocabulary strategy book in print today; however, although these are all excellent activities, it is important to remember that they are part of only one instructional strand of balanced vocabulary instruction.

Fluency Activities

There is an expression about a word being on the "tip of your tongue." It describes an event during which a word cannot be retrieved from memory when it is needed (Beck et al., (2002). When this happens, an individual has not developed fluency in using that word. Fluency activities are activities that require students to use target academic and technical words during timed speaking and writing events. Quick writing and quick talks are excellent examples of fluency-building activities for middle school students.

Summary

Given the increased demands on middle school students' understanding of academic and technical words throughout their coursework, it is critically important that students develop good control recognizing and using these words. For this reason, it is important that teachers and parents of middle school students focus attention on these words through reading, writing, speaking, and listening activities. Doing so will assist students' vocabulary knowledge, but more importantly, develop students' understanding of the content they are learning.

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***Jennifer Wells Greene, Ph.D.**, is an assistant professor in the School of Education at Georgia Gwinnett College in Lawrenceville, Georgia. Her research interests include specialized vocabulary in elementary and middle school education, as well as supporting grade-level teachers who want to incorporate word learning in their content-area classrooms. Dr. Greene is a literacy-teacher educator currently working with preservice teachers preparing for teaching certification. You can write to Dr. Greene at jgreen1@ggc.edu*