

# EL

## EDUCATIONAL LEADERSHIP

# LITERACY IN EVERY CLASSROOM

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prove such that any point on the curve is equidistant from a given point

$$QM'^2 + (M'(P))^2 \quad QP = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

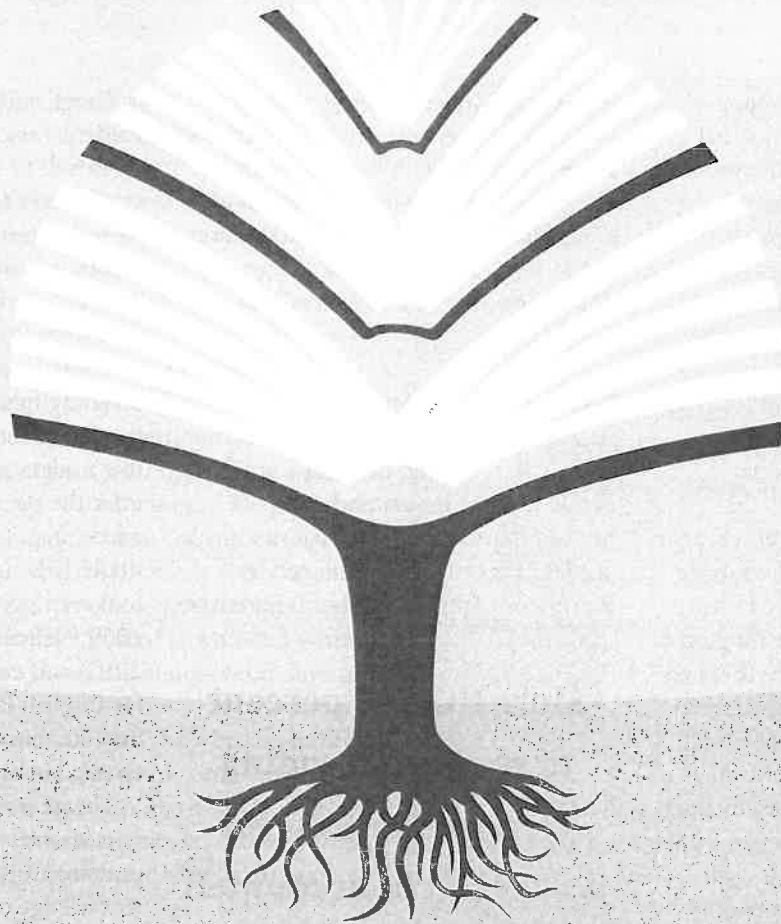
House shall be the judge of the Elections, Returns and Impeachments of its own

Members, Number may adjourn from day to day and may be adjourned

under such Rules as each House may provide.

may determine the Rules of its Proceedings, punish its Members for disorderly

shall keep a Journal of its Proceedings, and from time to time publish the same



# THE ROOTS OF COMPREHENSION

*Studying Latin and Greek word origins makes vocabulary instruction resonate.*

**Timothy Rasinski, Nancy Padak, and Joanna Newton**

**R**esearch going back seven decades demonstrates that vocabulary knowledge is strongly associated with proficiency in reading comprehension. Large vocabularies lead to better reading performance (Baumann et al., 2002; Davis, 1944). Amazingly, more than 80 percent of students' reading comprehension test scores can be accounted for by vocabulary knowledge (Reutzel & Cooter, 2015). Yet, the most recent assessment of

4th, 8th, and 12th grade students' vocabulary development shows that at all three grade levels, U.S. students have demonstrated no improvement at all in their vocabulary knowledge since 2009 (National Center for Education Statistics, 2015).

According to vocabulary scholar Margaret McKeown, very little vocabulary instruction happens in many U.S. classrooms (Banchemo, 2013). Where vocabulary instruction does occur, students often learn to view it

as painful and meaningless: weekly word lists and quizzes. Students may memorize words, spellings, and definitions, but these are quickly forgotten. The result of either approach—benign neglect or rote memorization—is stagnation in our students' vocabulary knowledge.

## **Content-Area Vocabulary: Slippery and Essential**

Clearly, there is a need for improved vocabulary instruction across grade

levels and content areas. Content-area words represent concepts that are integral to a field of study, yet mastering such vocabulary can be challenging for students because it involves learning new words for new ideas. Limited understanding of content-area vocabulary can lead to misconceptions and gaps in students' learning. It can hinder future learning (Blachowicz & Obrochta, 2005) as students try to build new understandings on existing knowledge. Moreover, students encounter content-area vocabulary infrequently outside of school, so they're unlikely to learn these terms indirectly (Worthington & Nation, 1996). Teachers face the dual task of helping students master new conceptual knowledge and teaching the terminology that goes with it.

Content-area vocabulary is abstract and technical, and it assumes multiple meanings in various contexts—all of which adds cognitive complexity to reading and learning. Students studying the American Revolution, for example, learn vocabulary terms such as *revolution*, *regiment*, and *movement*. Consider the different meanings, both literal and figurative, two of these terms assume in other content areas. In science, a *revolution* involves the literal act of the earth turning around the sun, whereas in social studies, it describes an act in which power is figuratively turned back to the people. Similarly, a *movement* in the context of the American Revolution refers to the colonists' efforts to establish independence from Britain. But in music class, students study *movements* in a symphony; in science they learn about tectonic *movements*; and in physical education class, they engage in physical *movement*.

The multiple meanings of many academic words are domain specific. So knowledge of a word in one context may not support understanding of that word in another context. Students must learn to be flexible thinkers and

develop an understanding of words that extends beyond single definitions. Likewise, teachers must ensure that vocabulary instruction is multidimensional and extends beyond dictionary definitions (Blachowicz & Fisher, 2009; Newton, Padak, & Rasinski, 2008).

### The Power of Roots

Basing vocabulary study on Greek and Latin roots can help. The academic register is vast and complex but not haphazard: The majority of academic words are connected by morphemic (meaning-based) patterns

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derived largely from Latin and Greek lexicons (Edwards, Font, Baumann & Boland, 2004; Graves, 2004; Padak, Newton, Rasinski, & Newton, 2008). Scholars estimate that up to 90 percent of words with more than one syllable have origins in Latin and that many of the remaining multisyllabic words share roots in Greek (Padak et al., 2008). These morphological patterns provide the foundation of much content-area vocabulary, as up to 76 percent of commonly occurring academic words share morphological roots (Coxhead, 2000; Hiebert & Lubliner, 2008). By analyzing these patterns, students can make connections between words that are semantically and conceptually related (Baumann, et al., 2002; Edwards, et al., 2004).

Teachers at all grade levels and content areas can provide instruction

in Greek and Latin roots to develop students' vocabulary. A morphological approach to vocabulary instruction emphasizes teaching affixes (prefixes, bases, and suffixes) that occur commonly in content-area words. This generative approach teaches meanings for key words while helping students learn to analyze and infer meaning from the structure of words in general. Students can then use this understanding to independently infer the meanings of new words they encounter. This approach may be particularly beneficial for students who find reading difficult (Kirk & Gillon, 2009; Nelson, Dole, Hosp, & Hosp, 2015) and can act as a learning bridge for English language learners whose first language is also based on Latin or Greek, such as Spanish.

The generative nature of Latin and Greek word roots gives them great potential for improving vocabulary. Knowledge of one root can lead to understanding of many English words. Take, for example, the Latin root *trac(t)*. Knowing that this word root means to drag, pull, or draw, students will better understand why a tooth *extraction* means to have a tooth pulled, *distracted* means to have your attention pulled or drawn away, a *contraction* can refer to muscles pulling together or two words being pulled into one, and a *tractor* is a vehicle used for pulling or dragging farm machinery.

Many teachers recognize the importance of using Latin and Greek word patterns to build vocabulary, but are still developing their own understanding of morphemic patterns and how they can use these patterns to expand students' word knowledge. Fortunately, teachers can tap online resources to identify roots, provide definitions, and find lists of English words containing key roots (see "Resources for Learning Your Roots" on page 44 for some of our favorite online resources).

## Working It In

It's not hard to bring Latin and Greek word roots into a classroom. The first step is to find the time. We recommend devoting 10 minutes per day at least three days per week; this should let you teach one or two word roots per week. Consider trying the following routine.

### Day 1. Introduce the Root

Focus on one or two roots per week. English language arts teachers might check the content covered in math, science, or social studies to find roots that are pertinent to students' current instruction in these areas. (See Figure 1 for a starter list of word roots related to the content areas.) Display the root and its essential meaning on a large classroom chart or screen. Brainstorm with students 5–10 words that contain that particular root, and write the words and their definitions on the chart. Keep the chart posted so you and your students can refer to it throughout the next several days of instruction.

Lead students in a discussion of how the word meanings contain the essential meaning of the word root. For example, if the root of the week is *terr(a)*, meaning earth or land, help students see how words such as *territory*, *terrace*, *terrain*, *subterranean*, and *Mediterranean* refer to earth or land in some essential way.

### Day 2. Divide and Conquer

Provide 5–10 words that contain the target root(s) for the week. Guide students in breaking each word into its essential parts (prefix plus base word, base word plus suffix, or word and inflected ending) and identifying the meaning of the parts. Then, discuss how a reader might get to the word's meaning by considering the meanings of individual word parts.

Here's an example using the *phil(e)* word root:

*Bibliophile*: *biblio* = books; *phile* = love(r). Lover of books.

*Philosopher*: *phil* = love; *soph* = wisdom; *-er* = a person. A person who loves wisdom.

*Philanthropy*: *phil* = love; *anthropy* = humanity, people. The love of people.

*Philadelphia*: *phil* = love; *adelphia* (*adeiphos*) = brother. City of brotherly love.

Over time, help students see that new concepts can be created by adding the meanings of word parts together.

### Day 3. Read and Reason

Vocabulary is important to the extent that it helps readers make meaning of texts. On the third day, students read and respond to passages that contain one or more words including the targeted word root, using their newfound vocabulary to construct meaning as they read. You might

## FIGURE 1: A FEW CONTENT-AREA WORD ROOTS FROM LATIN (L) AND GREEK (G)

### Math

*angl-*, *angul-* = angle, corner (L)

*dia-* and *per-* = through, across, thorough (L)

*frag-*, *fract-* = break, broken (L)

*graph-*, *gram-* = write, draw (G)

*integer-*, *integr-* = whole (L)

*later-* = side (L)

*meter-*, *metr-* = measure, meter (G)

*peri-* (G) and *circum-* (L) = around

### Science

*aster-*, *astr(o)-* (G) and *stell-* (L) = star, celestial body

*bi(o)-* = life, live (G)

*cardi(o)-* = heart (G)

*cry(o)-* = cold, frost (G)

*ge(o)-* (G) and *terr-* (L) = earth

*hem(o)-*, *hemat(o)-*, *-emia*, *-emic* = blood (G)

*hydr(o)-* (G) and *aqu(a/e)-* (L) = water

*spher-* = ball, globe; region, zone (G)

### Social Studies

*arch-*, *-archy* = leader, first, oldest (G)

*bell-* = war and *pac-* = peace (L)

*civ-*, *cit-*, *civil-* = citizen and *milit-* = soldier, fighter (L)

*-crat*, *-cracy* = rule, ruler (G)

*dic-*, *dict-* = say, speak, tell (L)

*equ(i)-*, *egal-* = equal, fair (L)

*popul-* (L) and *dem(o)-* (G) = the people

*urb-*, *urban-* (L) and *poli-*, *-polis* (G) = city

*human-* (L) and *anthrop(o)-* (G) = mankind, human



write a passage that highlights key words, have students write one, or use something you find. Here are two passages,<sup>1</sup> the first for older students and the second for younger, from our own work (Rasinski, Padak, Newton, & Newton, 2014a, 2014b):

### Segregation

We all know that racial *segregation* is outlawed in the United States—and for good reason. When a society segregates people according to their race, an injustice is committed against them. The Declaration of Independence states that “all men are created equal, that they are endowed by their Creator with certain unalienable rights, that among these are life, liberty, and the pursuit of happiness.” But a racially segregated society treats citizens unequally. In a segregated society, some people are denied basic human rights, such as the right to equal opportunities in housing, employment, or education. Not so long ago, some people were even denied the right to sit at a table in the same restaurant with others of a different race! Racially segregated societies do not provide equal access to liberty and the pursuit of happiness.

Far from honoring the dignity of each and every human being, segregation clusters people into “herds.” This is what the Latin base *greg-* means: In segregation, people are “herded” into separate clusters and kept apart from one another. A segregated society can never be an equal society. This is why U.S. law mandates racial desegregation.

Do you agree that a “segregated society can never be an equal society”? Why?

### Know your Fours!

Four quarters make a dollar  
 Four singers a quartet  
 Four quarts make a gallon  
 Quart means four I’ll bet.  
 Four sides make a quadrilateral  
 Four muscles make quadriceps  
 Now we know that quad means four  
 So how many babies make quadruplets?

This sequence allows students to experience word roots across time and in a variety of ways. Of course, you can always expand such lessons beyond three class sessions, trying activities

like completing sentences with relevant words, playing word games, and assessing students’ knowledge of word roots.

### Teacher Testimonials

Research has demonstrated the effectiveness of word-roots instruction with contextual analysis in primary and intermediate grade classrooms, in various content areas, and with struggling readers (Baumann et al., 2002; Biemiller, 2005; Harmon, Hedrick & Wood, 2005; Porter-Collier, 2010).

Lisha Cabral (2015) studied elementary science teachers who

collaborated with English language arts teachers to teach Greek and Latin roots. These teachers’ students were better able to understand the science terms provided than students who didn’t receive such instruction. Moreover, students who were taught word roots were more able to hypothesize the conceptual meaning of newly introduced science vocabulary than were students who were not provided with word-root instruction.

Teacher testimonials paint a similar picture. Joanna Newton has noticed that roots-based instruction improved her 3rd grade students’ understanding of content-area vocabulary. One student who was learning English as an additional language made a powerful connection between the Latin prefix *e/ex* and the word *erosion* during a science unit on weathering. The class had spent several days studying and exploring the Latin prefix *e/ex*, meaning “out” or “away from.” At the end of a lesson on soil erosion, a student named Aaliyah called out, “Erosion! Ms. Newton, is that *e* in *erosion* from *ex*?”

Newton responded that she was unsure. She invited students to share their thinking on the question: Was the *e* in *erosion* from *e/ex*? Why did they think so? Was there a meaning of “out” or “away from” in the word? The students reasoned that the *e* in *erosion* was from this prefix because soil was taken *away from* one place and moved to another. Newton invited Aaliyah to confirm the class’s thinking by looking the word up, and Aaliyah reported the next day that the class’s reasoning had been correct.

Middle school teacher and reading coach Hillary Loftus recently told us:

A solid background in the meaning of word roots helps all of my students with their reading comprehension. Recognizing and knowing how to apply root meanings is especially valuable for my students whose vocabularies are not as broad as I would like them to be. Often

## Resources for Learning Your Roots

- An online dictionary of common word roots and English words derived from each root: [www.learnthat.org/pages/view/roots.html](http://www.learnthat.org/pages/view/roots.html)
- Another presentation of Greek and Latin roots along with their meanings and examples of English words: [https://en.wikipedia.org/wiki/List\\_of\\_Greek\\_and\\_Latin\\_roots\\_in\\_English](https://en.wikipedia.org/wiki/List_of_Greek_and_Latin_roots_in_English)
- The “Additional Resources” tab at the bottom of this webpage includes a suggested list of word roots to teach by grade level and a related video. The “Research” tab includes a professional article on using word roots: [www.teachercreatedmaterials.com/administrators/series/buildingvocabulary-97](http://www.teachercreatedmaterials.com/administrators/series/buildingvocabulary-97)
- Search “teaching Latin and Greek root words” on YouTube to find short videos on approaches for teaching word roots to students in elementary through secondary grades: [www.youtube.com](http://www.youtube.com)

these students will encounter a word in their reading that initially seems intimidating and unsolvable. They used to freeze, give up, or just say the first few sounds and make something up. If a student can recognize the meaning of just one part of a difficult word, this provides him a foothold on the new vocabulary. Students don't give up as easily because they already know something about the word.

Words in English aren't random strings of letters; their patterns have logic and meaning, much of which comes from Latin and Greek. Unfortunately, many students are unaware of this link and unable to use it to learn new words and concepts. Let's help our students—and ourselves—gain this secret knowledge about English vocabulary. ■

<sup>1</sup>Excerpts from *Getting to the Roots of Social Studies Vocabulary* and *Getting to the Roots of Content Vocabulary*, copyright © 2014 Shell Education. Used with permission.

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