

Morphological Analysis Instruction in the Elementary Grades: Which Morphemes to Teach and How to Teach Them

Patrick C. Manyak, James F. Baumann, Ann-Margaret Manyak

Teaching the meanings of common affixes and steps for inferring the meanings of affixed words enhances students' word learning and fosters their interest in and attention to words.

The students in Ann-Margaret's (third author) third-grade class are mingling purposefully. They each have a word in their hand that features a common prefix, a common suffix, or both a prefix and a suffix, and they are trying to identify a group of peers whose words all share the same base word (e.g., *redo*, *doable*, *overdo*, *undoable*). When the students have found their groups, they sit down together and talk about each of the words, identifying the prefixes and suffixes and working out the word meanings. The conversations are lively and demonstrate the students' knowledge of the affixes ("I have *undoable*. It has the prefix *un-*, so that means not, and the suffix *-able*, which means can. So, *undoable* means something that can't be done"). After a few minutes, the groups quickly share their analysis of their words with the class, and then the class launches into a rousing game of Affix Jeopardy, a review activity that fosters intense group discussion of prompts such as "A team that doesn't lose a single game is ___." By the end of the game, the class has spent 30 minutes highly engaged in analyzing affixed words.

The activities described in this opening vignette represent instruction in morphological analysis (MA). We view MA as the process of using affixes (prefixes and suffixes), base words, and word roots to infer the meanings of words. In the elementary grades, instruction in MA typically includes teaching students commonly occurring affixes and word roots and a strategy for using knowledge of these word parts to construct meanings for unfamiliar words. Considerable research has demonstrated

that instruction in MA contributes to word recognition, spelling, and vocabulary knowledge (Ash & Baumann, 2017; Bowers, Kirby, & Deacon, 2010; Carlisle, 2010; Goodwin & Ahn, 2013). Furthermore, MA is an important dimension of vocabulary instruction in the Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). In *The Reading Teacher*, several authors have described the importance of and general strategies for teaching MA (Baumann, Ware, & Edwards, 2007; Goodwin, Lipsky, & Ahn, 2012; Kieffer & Lesaux, 2007). In this article, we provide teachers with further support in this area by addressing which specific affixes to teach in the upper elementary grades and describing a comprehensive approach for teaching affixes.

In the following section, we discuss several key principles from research on MA that guided our development of a multidimensional approach to affix instruction. Next, we briefly discuss the research projects in which we refined and evaluated this

Patrick C. Manyak is an associate professor of literacy education at the University of Wyoming, Laramie, USA; email pmanyak@uwyo.edu.

James F. Baumann is the Chancellor's Chair for Excellence in Literacy Education Emeritus at the University of Missouri, Columbia, USA; email baumannj@missouri.edu.

Ann-Margaret Manyak is a third-grade teacher in the East Grand School District, Grand County, CO, USA; email amanyak@egsd.org.

approach with diverse elementary school students. We then describe the development of a list of affixes (and a similar list of Latin and Greek word roots) that provides a potential scope and sequence for affix instruction in grades 3–5. Finally, we present the set of instructional activities that we designed to teach the meanings of affixes and the strategic use of affix knowledge to infer word meanings.

Key Principles From Research on MA Instruction

Literacy researchers have long recognized the importance of morphology in students' language and literacy development (Anglin, 1993; Nagy & Anderson, 1984; White, Power, & White, 1989). For example, Nagy and Anderson demonstrated that beginning in third grade, approximately 60% of words that students encounter in texts are constructed of derivational morphemes (affixes and roots). Highlighting the importance of morphologically derived words in vocabulary development, Nagy and Anderson stated,

For each word learned there are more than three derived words with meanings recognizably related to that of the base, and at least two of these involve fairly transparent relationships. This demonstrates that the ability to utilize morphological relatedness among words puts a student at a distinct advantage in dealing with unfamiliar words. (p. 323)

More recent studies and reviews of research have continued to underscore the importance of MA and have provided general guidelines for effective MA instruction (Baumann, Edwards, Boland, Olejnik, & Kame'enui 2003; Baumann et al., 2002; Bowers et al., 2010; Carlisle, 2010; Goodwin & Ahn, 2013; Goodwin et al., 2012; Kieffer & Lesaux, 2007; Nagy, Berninger, & Abbott, 2006). Further, several studies have focused specifically on affix instruction (Baumann et al., 2002, 2003; Graves & Hammond, 1980; White, Power, & White, 1989).

These studies have demonstrated that teaching affixes and the use of these affixes to construct word meanings can improve students' knowledge of the taught affixes (White, Power, & White, 1989) and use of these affixes to infer the meanings of untaught vocabulary words (Baumann et al., 2002, 2003; Graves & Hammond, 1980).

Our reading of previous research in the area of MA led us to identify three principles that informed our approach to teaching affixes. First, although our primary interest is in teaching MA to enhance students' ability to infer word meanings, instruction in word parts also contributes to word reading (Carlisle, 2010). In particular, instruction focused on using morphemes, the smallest meaningful units in words, to read words with multiple parts has proven effective with upper elementary students (Bowers et al., 2010; Goodwin & Ahn, 2013). Thus, we were conscious of the benefit of providing students with at least some guided practice in using morphemes to read affixed words.

Second, MA instruction should have several goals. Carlisle (2010) found that MA instruction in research interventions typically addressed one

or more of four different objectives: (1) awareness of the morphological structure of words; (2) meanings of specific affixes and roots; (3) analysis of how a word's morphemes contribute to its meaning, grammatical function, or spelling; and (4) strategies for using MA to infer word meanings. Although our affix instruction addressed all of these objectives, it focused on the meanings of high-utility affixes and a strategy for using MA to infer word meanings. In addition, we also introduced unfamiliar words that contained the target affixes, thus expanding students' general vocabulary.

Third, affixes and base words differ in terms of their semantic transparency (Carlisle & Katz, 2006). In simple terms, the meaning of an affixed word can be more easily inferred (e.g., *dishonest*) or less easily inferred (e.g., *discard*) from its parts. In designing lessons to introduce elementary students to MA, we

PAUSE AND PONDER

- How might the lists of target affixes and roots presented in this article cause you to rethink the affixes and roots that you select to teach?
- How could the lists in this article help your school provide more systematic instruction in high-value affixes and roots?
- How do you teach affixes? What are the strengths and weakness of this instruction? How could the instructional approaches described in this article enhance your current instruction?
- If you are a primary-grade teacher, how have you responded to standards within the English Language Arts strand of the Common Core State Standards that specify knowledge and use of common affixes in grades K–2, and how might this article change your instruction in this area?

intentionally selected semantically transparent words for instruction, believing that these words would best reinforce students' knowledge of the affixes and support their use of MA to infer word meanings.

Finally, in addition to using these specific insights from MA research, we also sought to apply general guidelines for effective literacy teaching (e.g., Pressley, 2006) when developing MA instruction. In particular, when designing lessons, we sought to balance explicit instruction and highly participatory activities, foster student engagement, prompt students to engage in metalinguistic talk, and provide ongoing review of taught meanings and strategies.

These principles have guided Patrick's (first author) and Jim's (second author) research and development of affix instruction for over a decade. In the following section, we describe the two recent research projects in which we refined and tested the affix instruction we share in this article.

Our Research on Teaching Morphemic Analysis

Patrick, Jim, and colleagues conducted a large, federally funded three-year research project involving the design and implementation of a multifaceted, comprehensive vocabulary instructional program (MCVIP) in fourth- and fifth-grade classrooms, including several mixed English learner and native English speaker classes (Baumann et al., 2013). MCVIP instruction focused on several key components of vocabulary instruction, including the teaching of word-learning strategies. As a part of this strategy instruction, the team drew on Jim's prior research on MA (Baumann et al., 2002, 2003) to develop a set of explicit lessons for teaching the meanings of common affixes, Latin and Greek word roots, and a morphological strategy for inferring word meanings (Baumann, Edwards, Boland, & Font, 2012).

To assess the MA instruction, the MCVIP team constructed the Morphemic Analysis Assessment (MAA), a 53-item test that assessed students' ability to segment words into individual morphemes, match taught affixes and roots to their meanings, and select the best meanings for low-frequency affixed words not included in MCVIP lessons. MCVIP MA instruction produced large, statistically significant pretest–posttest (fall to spring) gains on the MAA at each research site for each year of the study.

At the conclusion of the MCVIP research, Patrick and Ann-Margaret, a third-grade teacher in a small town in Colorado, initiated the Vocabulary and

Language Enhancement (VALE) project in Ann-Margaret's classroom. As one part of this project, they further developed a multidimensional approach to teaching affixes. During the 2016–2017 school year, Patrick administered a 42-item version of the MAA (the original test without the items assessing Latin and Greek word roots) to Ann-Margaret's students in September and in May. A paired-sample t-test indicated that pretest–posttest gains were statistically significant, with an accompanying extremely large effect size of 2.38 (Cohen's *d* statistic; $d > 0.8$ is considered large). In addition, a comparison between students who scored lower on the MAA pretest and those who scored higher on the MAA pretest indicated no significant differences between these two groups' pretest–posttest growth. Thus, all of the students, regardless of their initial performance on the MAA, responded positively to the affix instruction.

It is important to note that neither the MCVIP nor VALE projects included a control group. Thus, it is possible that other factors may have contributed to the students' pretest–posttest growth on the MAA or that other forms of instruction may have resulted in even greater growth. However, given that the MAA assessed knowledge and skills that were closely aligned with MA instruction, we believe it is highly likely that this instruction contributed centrally to the students' pretest–posttest gains. In addition, Patrick's qualitative observations of the MA instruction documented consistently high student engagement in the lessons, a sophisticated level of student discourse related to word parts and their meanings, and students' enthusiasm for locating words that included the taught affixes.

Finally, although we have no direct evidence that the gains that students in both projects made on the MAA contributed to more general outcomes such as accelerated growth in vocabulary knowledge, we believe that teaching students to break apart words by and build words with morphemes, master the meanings of common affixes, and analyze how affixes affect word meanings constitutes a valuable component of comprehensive vocabulary instruction, one that prompts students to engage in careful analysis of words and provides them with tools to better infer meanings of unfamiliar words.

Which Morphemic Elements to Teach Affixes

Table 1 contains a list of affixes that we recommend teaching in grades 3–5. It contains 41 affixes, with 14, 16, and 11 listed for instruction in grades 3, 4, and

Table 1
Affixes for Instruction at Grades 3, 4, and 5

Family	Grade 3	Grade 4	Grade 5	Meaning	Example words
Not prefixes	<i>dis-</i>			not, opposite	<i>dislike, disobey, disagree</i>
	<i>un-</i>			not, opposite	<i>unhappy, unlock, unafraid</i>
	<i>in-</i>			not, opposite	<i>incorrect, invisible, inappropriate</i>
		<i>im-</i>		not, opposite	<i>impossible, impolite, impatient</i>
		<i>non-</i>		not, opposite	<i>nonfiction, nonstop, nonliving</i>
			<i>il-</i>	not, opposite	<i>illegal, illogical, illegible</i>
Position prefixes			<i>ir-</i>	not, opposite	<i>irregular, irresponsible</i>
	<i>pre-</i>			before	<i>pretest, preheat, preschool</i>
		<i>post-</i>		after	<i>postgame, postwar, postseason</i>
		<i>mid-</i>		middle	<i>midnight, midday, midair</i>
			<i>inter-</i>	between	<i>intercity, interstate, interact</i>
			<i>intra-</i>	among	<i>intrastate, intracellular</i>
			<i>fore-</i>	before	<i>foresee, foretell, forewarn</i>
Over/under prefixes			<i>trans-</i>	across	<i>transatlantic, transnational, transplant</i>
	<i>over-</i>			more than, too much	<i>overheat, overwork, overpriced</i>
		<i>super-</i>		over, high, big, extreme	<i>superheat, superstar, supermarket</i>
		<i>under-</i>		low, too little	<i>undersea, underachiever, undercook</i>
Against prefixes			<i>sub-</i>	under, below	<i>subset, subtitle, subcommittee</i>
			<i>anti-</i>	against	<i>antifreeze, antiwar, antidiscrimination</i>
Bad prefixes			<i>counter-</i>	against, opposite	<i>counterclockwise, counterargument</i>
	<i>mis-</i>			bad, wrong	<i>misspell, misunderstand, misbehave</i>
Number prefixes			<i>mal-</i>	bad, wrong	<i>malnutrition, maltreat, malformed</i>
		<i>uni-</i>		one	<i>unicycle, unicolor, unicellular</i>
		<i>mono-</i>		one	<i>monorail, monotone, monoplane</i>
		<i>bi-</i>		two	<i>bicycle, biweekly, biplane</i>
Other useful prefixes		<i>tri-</i>		three	<i>tricycle, triangle, trimotor</i>
	<i>re-</i>			again, back	<i>rewrite, rebuild, rearrange</i>
		<i>de-</i>		take away, from	<i>deice, debug, defrost</i>
More and most suffixes			<i>co-</i>	with, together	<i>coauthor, coequal</i>
	<i>-er</i>			more of something	<i>taller, smarter, warmer</i>
Person who suffixes	<i>-est</i>			most of something	<i>tallest, smartest, warmest</i>
	<i>-er</i>			person who	<i>teacher, writer, banker</i>
	<i>-or</i>			person who	<i>sailor, actor, explorer</i>
		<i>-ist</i>		person who	<i>artist, guitarist, nutritionist</i>
	<i>-ee</i>			person who	<i>employee, trainee, attendee</i>

(continued)

Table 1
Affixes for Instruction at Grades 3, 4, and 5 (continued)

Family	Grade 3	Grade 4	Grade 5	Meaning	Example words
Other useful suffixes	-ful			full of	<i>useful, joyful, cheerful</i>
	-ness			state or quality of	<i>weakness, illness, careless</i>
	-ly			like, full of	<i>clearly, costly, carefully</i>
		-y		like, full of	<i>lengthy, chilly, wealthy</i>
		-less		without	<i>hopeless, worthless, careless</i>
		-able		can be, worthy	<i>doable, workable, knowledgeable</i>

5, respectively. The list emanates from Jim's prior research on teaching MA as a vocabulary-learning strategy to upper elementary students. The morphemes in this table result from several syntheses

of existing affix lists and a more recent systematic analysis of which morphemes might be taught and when. We give details of the development of this list in Table 2.

Table 2
Development of the Affix and Latin/Greek Root Lists

Jim initially assembled the most commonly included affixes on lists prepared by noted scholars and organized them into affix families, which were used in two intervention studies with fourth and fifth graders (Baumann et al., 2002, 2003). He expanded the lists of high-frequency affixes (Baumann, Font, Edwards, & Boland, 2005) that were taught to fifth graders in a yearlong vocabulary study (Baumann et al., 2007). Later, he conducted a more thorough analysis that resulted in 35 morphemes being included in the word-learning strategies component of the MCVIP research (Baumann et al., 2013). For this article, Jim conducted a more systematic analysis, as follows:

1. Returning to the most noteworthy lists of morphemes scholars have recommended for instruction and adding potential candidates to the MCVIP list. This resulted in a more extensive list of 92 items (69 affixes and 23 word roots) that were potential candidates for instruction in grades 3–5.
2. Analyzing the 92 morphemes to (a) designate those that were on White, Sowell, and Yanagihara's (1989) empirical list of the most frequently occurring affixes; (b) include frequency ranks for each affix and root from Becker, Dixon, and Anderson-Inman's (1980) rank-ordered list of 6,531 morphographs (generally synonymous with *morpheme*), which they constructed by analyzing 25,782 words from school texts; (c) identify which affixes and roots Templeton (2004) recommended be taught in grades 3 and 4, grades 5 and 6, or grades 7+; and (d) listing the most frequently occurring example words for each morpheme (e.g., *unhappy* for the prefix *un-*, *teacher* for the suffix *-er*, *television* for the root *tele*).
3. Engaging in an analysis of a tabular display of the information from the preceding point for all 92 morphemes to determine which merited instruction, and if so, at which grade level. This analysis involved examining all data points and applying an empirical-theoretical-experiential analysis process, as per the following example.

Not prefix family example: The prefix *un-* was on White, Sowell, and Yanagihara's (1989) list, it had a rank of 9 on Becker et al.'s (1980) analysis, and Templeton (2004) recommended that it be taught to students in grades 3 and 4; thus, we list *un-* at grade 3. In comparison, the prefix *im-* was also on White, Sowell, and Yanagihara's list and had Templeton's grades 3–4 designation, but Becker et al. gave it a lower frequency rank (38), so we designate it for instruction in grade 4. The prefix *il-*, also on White, Sowell, and Yanagihara's list, had a lower frequency yet (88), so we recommend it be taught in grade 5. Although the quantitative data were highly influential in judging which affixes should be taught and when, there were exceptions. For example, the prefix *a-* (meaning not or without) had a relatively high rank (25), but the potential instructional words that fit our strict definition were relatively low-frequency and not necessarily conceptually accessible for elementary students (e.g., *asymptomatic*, *asepsis*). Therefore, we do not recommend that this affix be taught in grades 3–5.

Jim's primary objective when selecting affixes to teach was to identify those affixes that, when taught well, enabled students to infer the meanings of as many novel words containing the target affixes as possible. Jim used four criteria for selecting affixes for instruction:

1. Teach affixes that meet a strict definition of prefix or suffix. A strict definition (Stotsky, 1978) means that an affix must be attached to a base word, as in *dislike*, *unfair*, *hopeless*, and *teacher*. This excludes words that have absorbed or assimilated prefixes (e.g., *accept*, *erase*).
2. Teach affixes that have consistent, concrete meanings. For example, the prefix *dis-* consistently means not, and the suffix *-ful* typically means full of.
3. Teach affixes that have the highest frequency. This gives students the potential to learn the greatest number of new words through instruction in MA. For example, teaching *dis-* and *un-* leads to learning scores of new words, whereas teaching the less frequent prefixes *dys-* and *hypo-* does not.
4. When possible, organize affixes into semantic groups or families. Grouping affixes into semantic categories provides students with a mnemonic for remembering the meanings of related affixes.

We offer several guidelines and qualifications when selecting affixes to teach from Table 1. First, although we believe that our list of affixes provides an excellent starting point for planning affix instruction in grades 3–5, the list includes only suggested affixes to teach. Therefore, teachers should make final decisions about what affixes to teach and when by drawing from their knowledge and experience, their local curriculum, and local or national standards.

Second, teachers should adjust the recommended grade levels for instruction up or down as needed or even differentiate within a single class, given students' developmental levels in related literacy skills such as spelling. For instance, Ann-Margaret's third graders were high performing; therefore, she taught many of the affixes identified on our list as fourth- or fifth-grade targets. However, regardless of when affixes are initially taught, we consider it essential that teachers provide cumulative review and re-teaching of all target affixes.

Third, note that our affix list does not include inflectional suffixes: plurals (e.g., *cats*, *bushes*) and tense inflections (e.g., *walks*, *walked*, *walking*). These are important aspects of MA, but we assume that these will have been taught previously in grades 1 and 2. Similarly, although we not address instruction in compound words in this article, we recommend such instruction beginning in late first grade or in second grade.

Fourth, given that the frequency of prefixed words in reading materials increases greatly in third grade (White, Power, & White, 1989), we chose grade 3 as a starting point for focused affix instruction and thus for our grade-level affix lists. However, the Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010) identified knowledge of frequently occurring affixes as a standard for grades K–2, and clearly, students in these grades encounter affixed words and thus may benefit from instruction in common affixes. For affix instruction in grades K–2, we recommend selecting a small number of target prefixes and suffixes that have concrete meanings and are present in common words with meanings accessible to younger students. For example, working with a team of second-grade teachers, Patrick selected the following 12 affixes for instruction at the second-grade level: *un-*, *dis-*, and *in-* (not prefix family); *over-* and *under-* (place prefix family); *mis-* (bad prefix family); *re-* (other useful prefixes); *-er* and *-est* (more and most suffix family); *-er*, *-or*, and *-ist* (person who suffix family). These affixes have clear primary meanings and generate a number of words with meanings that are accessible to most primary students (e.g., *unhappy*, *dishonest*, *incorrect*, *overcook*, *underwater*, *misbehave*, *redo*, *writer*, *actor*, *artist*). With regard to instruction, we believe that the explicit instruction, guided practice, and engaging review strategies that we describe later in this article would be appropriate or could easily be modified for the primary grades.

Finally, our list of affixes is not exhaustive; instead, it represents those affixes that we believe are most appropriate for instruction in grades 3–5 and that will enable students to figure out the meanings of as many new words as possible (or reinforce their understandings of affixed words that they know incompletely). In the More to Explore sidebar at the end of this article, we list resources that teachers can use to identify additional, lower frequency affixes and word roots, should they wish to extend MA to additional morphemes.

Latin and Greek Word Roots

Jim's development of a systematic list of morphemes to teach in the upper elementary grades extended beyond affixes to Latin and Greek word roots. Although this article focuses on affix instruction, we include his list of 22 Latin and Greek word roots for instruction (see Table 3). To select the roots for this list, Jim followed the four affix selection criteria outlined previously (and the specific procedures described in Table 2). Thus, he selected the word roots listed in Table 3 based on frequency and consistent meanings; when possible, he placed them into semantic families. Our experience and research (White, Power, & White, 1989) have suggested that formal instruction in roots is beneficial for students at and above grade 4, so we recommend that fourth- and fifth-grade teachers begin teaching the word roots listed as

they continue with instruction in affixes. Although teaching word roots is similar to teaching affixes, we refer readers to additional sources for specific descriptions of word root instruction (Baumann et al., 2007, 2012).

How to Teach Affixes

We now describe and illustrate the four activities that constituted the multidimensional VALE affix instruction. This instruction resulted from a three-year process in which Patrick and Ann-Margaret refined and enhanced the MCVIP MA lessons in her third-grade class. The majority of VALE affix instruction took place during an eight-week period. Ann-Margaret began each week with a PowerPoint lesson that provided an explicit introduction to one of the affix families and an

Table 3
Latin and Greek Word Roots for Instruction at Grades 4 and 5

Family	Root	Meaning	Example words
Look and light roots	<i>scope</i>	to look at	<i>telescope, microscope, kaleidoscope</i>
	<i>vis, vid</i>	to see or watch	<i>vision, video, visibility</i>
	<i>photo</i>	light	<i>photograph, photocell, photon</i>
Communication roots	<i>dict</i>	to speak or say	<i>predict, dictator, dictaphone</i>
	<i>script, scribe</i>	write	<i>scribble, transcribe, manuscript</i>
	<i>phon/phone</i>	sound	<i>telephone, headphone, symphony</i>
	<i>graph</i>	to write or draw	<i>biography, autograph, paragraph</i>
	<i>aud/audi</i>	to hear	<i>audience, audible, auditorium</i>
Build or break roots	<i>rupt</i>	break	<i>eruption, interrupt, bankrupt</i>
	<i>fract</i>	break	<i>fracture, fraction, refract</i>
	<i>struct</i>	build	<i>construct, structure, destruct</i>
Movement roots	<i>tract</i>	drag, pull	<i>tractor, subtract, distract</i>
	<i>mot, mov</i>	move	<i>motion, remote, demote</i>
	<i>port</i>	carry	<i>export, import, portable</i>
Other useful roots	<i>bio</i>	life	<i>biology, biofuel, symbiotic</i>
	<i>tele</i>	far	<i>telescope, television, telegram</i>
	<i>geo</i>	earth	<i>geology, geography, geode</i>
	<i>therm</i>	heat	<i>thermometer, thermostat, hypothermia</i>
	<i>micro</i>	small, tiny	<i>microscope, microwave, microchip</i>
	<i>astr</i>	star	<i>astronomy, astronaut, astrobiologist</i>
	<i>path(y)</i>	feeling, suffering	<i>sympathy, empathy, telepathy</i>
	<i>phobia</i>	fear	<i>zoophobia, hydrophobia, acrophobia</i>

experience with the word-part strategy. Following each introductory lesson, she used three extension and review activities for the remainder of the week.

Explicit Instruction in Affixes and the Word-Part Strategy

Each week of VALE affix instruction began with explicit teaching of an affix family and guided practice in using the word-part strategy to infer word meanings. We used a consistent six-step sequence of activities to introduce each prefix family and a set of similar activities to introduce the suffix families. Here, we illustrate these six steps using examples from the first prefix family that Ann-Margaret taught, the not prefix family.

1. *Introduction:* Present and discuss a chart that includes each prefix, its meanings, and example words (see Figure 1).
2. *Analyze words:* Explain how the target affixes affect word meanings (“When you see a not family prefix, simply say *not* before the rest of the word. For example, when you see *unhappy*, you say not happy.”). Ask students to explain the meanings of a series of words containing the target affix (“What does *incorrect* mean? What does *dishonest* mean?”).
3. *Examine affixed and pseudo-affixed words:* Explain that some words that begin with the prefix letters do not actually contain the prefix:

We know that *unhappy* begins with the prefix *un-*. We can test this by saying *not* before the base word and checking if what we say makes sense. In this case, “not happy” makes sense. The word *uncle* also begins with *un-*, but these are just the letters *u-n* and not a prefix. We know this because when we say “not cle,” it doesn’t make sense. Look at these two words (*unkind* and *uniform*) and test each of them. Which one has a not prefix? How do you know?

4. *Practice building words:* Present a slide that has a column of prefixes and a column of base words and ask students to build specific words using one of the prefixes and one of the base words. (“Who can use one of the prefixes and one of the base words to build a word that means not kind?”)
5. *Quiz:* Show a simple fill-in-the-blank quiz that prompts students to provide common words that include the target affixes. (“The moment I broke the dishes, I wished I could ___.” [*disappear*])
6. *Collection challenge:* Challenge students to find words that include the target affixes and add them to a wall chart, with the enticement that the class will play a game of Affix Jeopardy when students have added a certain number of words to the chart.

The initial PowerPoint lesson also demonstrated how the use of morphemes can help a reader decode polysyllabic words. Ann-Margaret returned to this focus again in the suffix lessons, where students were prompted to put slashes between prefixes, bases, and suffixes in affixed words such as *unforgivable* and then to use the morphemic elements to read the words. The second PowerPoint lesson introduced the word-part strategy (see Figure 2), and each subsequent lesson guided students in applying the four steps of this strategy to infer an unfamiliar word presented initially in the context of a sentence (for an example of the first three steps in this practice, see Figure 3).

Extension and Review Activities

Following each week’s explicit introductory lesson, Ann-Margaret engaged students in three extension and review activities. These activities fostered active student participation, heightened the class’s interest in affixed words, and provided opportunities for students to apply MA to construct word mean-

Figure 1
Slide Introducing the Not Prefix Family

The Not Prefix Family

Prefixes are word parts that are added to the **beginning of a word**. They can tell us a lot about a word’s meaning. We will start learning about word parts by studying 3 **prefixes** that all mean *not*.

Not Prefix Family

Prefix	Example Word
dis-	dishonest
un-	unhappy
in-	incorrect

Note. The color figure can be viewed in the online version of this article at <http://ila.onlinelibrary.wiley.com>.

Figure 2
Slide Outlining the Word-Part Strategy

The Word-Part Strategy

Word parts can help us understand the meaning of words. Here is a strategy for using word parts to figure out a word's meaning:

- 1) **Find the base:** the base is the main part of the word. It comes after a prefix and before a suffix.
- 2) **Think about what the base means.**
- 3) **Find the prefix and/or suffix and add their meanings to the meaning of the base.**
- 4) **If necessary, change the definition around until it sounds better or makes more sense.**

Note. The color figure can be viewed in the online version of this article at <http://ila.onlinelibrary.wiley.com>.

Figure 3
Guided Practice With the Word-Part Strategy

The Word-Part Strategy

Imagine that you read the sentence...

My big brother went for a **predawn** run.

and are not sure what **predawn** means. Let's try the 4 steps of the **Word-Part Strategy**:

1. What is the base in **predawn**? How do you know?
2. What does '**dawn**' mean?
3. Find the prefix in **predawn** and add its meaning to the meaning of the base:
 _____ + the first light in the morning

Note. The color figure can be viewed in the online version of this article at <http://ila.onlinelibrary.wiley.com>.

ings. Here we describe these extension and review activities.

Collecting Affixes. Each PowerPoint lesson that Ann-Margaret taught concluded with a challenge to find and chart words that included the week's affixes. For example, the lesson on the place prefix family concluded with the following charge:

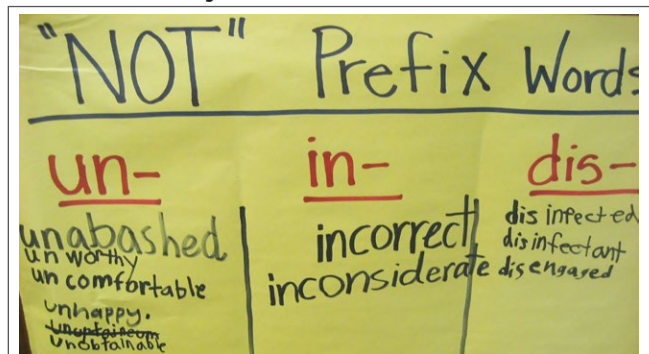
Your challenge is to look and listen for words that begin with the place prefix family prefixes. If you read or hear one, then write it down and share it with Mrs. Manyak. If your word uses a place prefix, you will add the word to the chart and share it with the

class. When the class has collected 12 words, we will be ready for more Affix Jeopardy!

To start the affix collection, Ann-Margaret put up a poster-paper chart with columns for each of the week's affixes (see Figure 4). When a student found a word that they believed included a target affix, they shared it with Ann-Margaret to confirm that it was an appropriate example. If so, the student added the word to the affix chart. Ann-Margaret then called the class's attention to the word and discussed its meaning. The Collecting Affixes activity made the students aware of affixed words throughout the day and enabled Ann-Margaret to discuss meanings of new words containing the target affixes.

Word Family Grouping. Ann-Margaret used Word Family Grouping to establish teams for games of Affix Jeopardy. The activity prompted students to analyze the word parts in sets of related words and to use MA to construct word meanings. Word Family Grouping began with each student receiving a word card with a word belonging to one of four base-word families (for an example, see Table 4).

Figure 4
Not Prefix Family Wall Chart



Note. The color figure can be viewed in the online version of this article at <http://ila.onlinelibrary.wiley.com>.

Table 4
Families for Word Family Grouping

<i>happier</i>	<i>redo</i>	<i>overuse</i>	<i>thoughtful</i>
<i>unhappy</i>	<i>undo</i>	<i>reuse</i>	<i>thoughtless</i>
<i>happiness</i>	<i>doable</i>	<i>useful</i>	<i>rethink</i>
<i>happiest</i>	<i>overdo</i>	<i>useless</i>	<i>unthinkable</i>
<i>unhappily</i>	<i>undoable</i>	<i>unusable</i>	<i>overthink</i>

The students identified the base word in their word and found the other students whose words included the same base word. Once students had gathered in their groups, they identified the affixes in their words and discussed each word’s meaning. Ann-Margaret then put a list of all of the words on the document camera and asked the groups to divide each of their words into prefix, base, and suffix. Following the groups’ directions, she put slashes between these elements (e.g., *un|do|able*). She also asked the group to explain the meaning of each word (e.g., “something that can’t be done”). The groups received 100 points for the upcoming Affix Jeopardy game if they correctly segmented each of their words and explained each word meaning.

Patrick’s qualitative observations of Word Family Grouping indicated that students were highly engaged in peer teaching, metalinguistic talk, and thoughtful word analysis throughout the activity. Furthermore, the groups rarely stumbled when segmenting words or explaining the word meanings to the rest of the class.

Affix Jeopardy. During the period of affix instruction, Ann-Margaret typically led the class in a game of Affix Jeopardy once a week. Affix Jeopardy constituted an engaging review of target affixes and affixed words. In Ann-Margaret’s class, students participated in four- or five-member teams. The teams took turns selecting a column and

value on the Affix Jeopardy table (the bottom row counted for 100 points, the second-to-last row 200 points, and so on). Ann-Margaret revealed the prompt, and the teams briefly discussed their answer. Ann-Margaret established that she could call on any member of the team to respond, so the teams had to ensure that each member was prepared to answer. If a team did not answer correctly, the other teams had a chance to respond. If none of the teams knew the word, Ann-Margaret would then give a hint, often providing the base word, and the groups would have another chance to guess.

The Jeopardy games reviewed previously taught affixes. Thus, the first game focused exclusively on words that included the not prefix family. Table 5 shows a Jeopardy board used at the end of affix instruction that reviews various affixes studied. Each of the Jeopardy boards included common words at the 100- and 200-point rows (e.g., *unhappy*, *redo*) and less familiar words at the higher point rows (e.g., *ungrateful*, *precaution*). Consequently, the games reviewed the target affixes using well-known example words and also introduced students to less familiar words that employed these affixes. The less familiar words often prompted students to engage in serious MA as they strove to work out answers by combining the target prefixes with a variety of relevant base words. Many of their guesses represented plausible nonwords (e.g., “precareful” for *precaution*). On such occasions, Ann-Margaret

Table 5
Affix Jeopardy Board

Other useful prefixes	Not family prefixes	Place family prefixes	Prefix + suffix
I can never say <i>cinnamon</i> correctly. I always ___ it.	A solution to a problem that is not logical is ___.	The football team was at the 50-yard line, or ___.	Something that can’t be replaced is ___.
When a sentence sounds awkward, good writers try to ___ it.	I don’t like to wear formal clothes. I like to dress in an ___ way.	To take caution ahead of time	Something that just doesn’t help is ___.
To spell something wrong	Something that is not perfect	The trip was four hours long, so after two hours, we were ___ there.	Something that can be used again is ___.
To remove ice from a car windshield	Someone who doesn’t tell the truth is ___.	After the game, the angry coach refused to give a ___ interview.	The boy’s story about seeing an alien spaceship was ___.
To behave in the wrong way	I always want to be the first to ___ my presents on Christmas.	To not get paid enough	Someone who doesn’t show a lot of respect is ___.

highlighted the good thinking that the group had done and that their guess, although not an actual word, indeed called to mind the meaning of the word in question.

Collectively, the PowerPoint lessons, Collecting Affixes, Word Family Grouping, and Affix Jeopardy took up relatively little class time over an eight-week period. However, through these activities, students received explicit instruction in affix meanings and guided practice with the word-part strategy, independently hunted for words with the target affixes, collaboratively analyzed affixed words, and encountered unfamiliar words that included the target affixes. Student engagement remained high across these activities and, as we described previously, the students demonstrated tremendous growth on an assessment of MA.

Conclusion

Given that affixed words proliferate in reading texts beginning in third grade (Nagy & Anderson, 1984; White, Power, & White, 1989), teaching students the meanings of common affixes and the strategic use of affix knowledge to infer novel word meanings can play a role in students' vocabulary development (Baumann et al., 2002, 2003, 2013). In this article, we shared a principle- and evidence-based list of target affixes for grades 3–5, along with a set of Latin and Greek word roots to teach in grades 4 and 5. We also described a set of instructional activities, developed over several years of implementation and refinement, that produced robust learning and a high level of student engagement. Although affix instruction should not be the sole focus of MA instruction in the elementary grades (Goodwin et al., 2012), we have found that teaching the meanings of commonly occurring affixes and a strategy for analyzing the meanings of affixed words promoted students' interest in words and provided them tools for independent word learning. Thus, we encourage teachers to plan for and implement affix instruction as a valuable component of comprehensive vocabulary instruction.

NOTES

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TAKE ACTION!

1. If you teach grades 3–5, select a relevant prefix family from the grade-level list and prepare an explicit lesson that includes the using the six steps described in the article. If you teach grades K–2, select a small number of prefixes with concrete meanings and prepare an explicit lesson based on but modifying the six steps where appropriate.
2. Prepare a lesson that introduces the four steps in the word-part strategy and guides students in applying the steps to infer the meanings of less familiar affixed words (e.g., *predawn*, *rearrange*).
3. Teach the prefix family and word-part strategy lessons and conclude by challenging students to identify words that feature the target prefixes and add them to a class chart.
4. Prepare and play a game of Affix Jeopardy to review the taught prefixes and introduce students to a few challenging words containing those affixes.
5. Discuss with your colleagues the possibility of implementing consistent schoolwide MA instruction using the grade-level lists of affixes and roots and the teaching activities presented in this article.

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MORE TO EXPLORE

The following websites provide access to a variety of lists of prefixes, suffixes, and word roots for those interested in expanding instruction beyond the lists included in this article:

- “English Language Roots” provided by PrefixSuffix.com: <http://www.prefixsuffix.com/rootchart.php?navblks=1011110>
- Prefix, suffix, and root dictionaries by Eugene M. McCarthy: <http://www.macroevolution.net/index.html>
- “Common Prefixes, Suffixes, and Root Words” by Jessica DeForest: https://msu.edu/~defores1/gre/roots/gre_rts_afx1.htm
- Dictionary of affixes by Michael Quinion: <http://affixes.org>