UNLOCKING *Literacy*

Effective
Decoding & Spelling
Instruction

by

Marcia K. Henry, Ph.D.

The vignettes in this book are based on the author's actual experiences. In all
instances, identifying details have been changed to protect confidentiality.

7
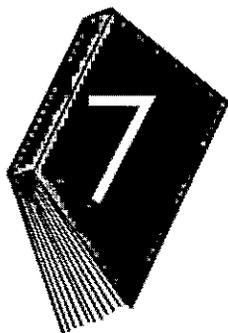
Advancing Readers

Time for the Latin and Greek Layers of Language

Upper elementary school students need to go beyond phonics, syllable knowledge, and simple prefixes and suffixes because word length and complexity change dramatically beyond third grade. Yet, although federal funding for reading initiatives has increased, as of 2003 most available funds target children in preschool through third grade. It cannot be assumed that by the end of third grade, children are even ready to learn all that must be learned about the structure of language as it relates to reading and spelling.

New strategies are required for decoding and spelling the multisyllabic words that upper-grade students will find in literature and in content area textbooks. The end of third grade is the time to introduce students to the Latin roots and Greek combining forms used frequently in social studies, math, and science texts. Toward the last semester of third grade, introduce some of the very common Latin roots (e.g., *form, port*) with additional prefixes and suffixes (e.g., *informal, information, formality, export, portal, important*). If third graders do not understand basic letter–sound correspondences or syllable division, these principles must be taught. Take a month or so to introduce or review the patterns in the 2 × 3 Anglo-Saxon letter–sound correspondence matrix (see Figure 3.2 in Chapter 3). Also review the common syllable division patterns before beginning to teach roots of Latin or Greek origin. You may want to introduce your students to common roots found in social studies text-books. For example, third-grade geography books often discuss the *exports* and

imports from numerous countries. Therefore, *port* is a logical first root to present. Words such as *export, import, imported, important, exporting, report, porter, portal,* and *transportation* can all be taught with emphasis on affixes and roots. The term *geography* is an interesting one for students to use to begin learning about Greek word roots or combining forms, with *geo* (earth) and *graph* (to write) as the main forms. Teachers of students in the upper grades can determine whether to teach the common Latin roots before introducing the Greek layer or to interweave the two.

By the time students begin to learn the Latin and Greek base elements, students are also using cursive writing. As in the primary grades, students need to trace and copy and practice cursive letters and difficult connections such as *bv, ow,* and *ov.* As students write from memory, ask them to say the sound or name of each letter. As soon as several cursive letters have been taught, the letters can be joined in pairs or short words.

The Latin and Greek layers of the language provide students with concepts that are more abstract than the concepts portrayed by the words of Anglo-Saxon origin (Quirk, 1974). By learning the common Latin roots and Greek combining forms, students will begin to recognize the useful orthographic forms and understand specific meanings of these base elements as well. Learning these important patterns provides strategies for not only decoding and spelling but also for expanding expressive and receptive vocabulary. The patterns may well make mind pictures for students, making word retrieval more memorable. For example, imagining a volcano as it *erupts* or knowing someone whose appendix has *ruptured* helps students recall the meanings of the root *rupt* and words that contain it. Fortunately, words of Latin and Greek origin tend to be extremely regular; that is, they follow regular letter–sound correspondences even though the words are longer than those of Anglo-Saxon origin. Teachers need to encourage their students to become *linguaphiles* (lovers of words and language) and to begin to transfer decoding skills to literature reading and content area reading.

WORD WISDOM: *MORPH* WORDS

A *morpheme* is the smallest unit of meaning in a word.

Morphemics is the study and description of language in terms of morphemes.

A *morphemicist* is one who studies morphemics.

An *allomorph* is any variant form of a morpheme. For example, /s/ in cats, /z/ in dogs, /əz/ in horses, and /ən/ in oxen are allomorphs of the English plural morpheme. The combining form *allo* comes from the Greek word *allos,* meaning *other.*

COMMON MORPHEMES

Estimates of vocabulary knowledge vary widely. Goulden, Nation, and Read (1990) concluded that the typical educated native speaker of English has a vocabulary of approximately 17,000 words. These have been acquired at the rate of about two to three words per day. Anderson and Nagy (1992) believed that this number was greatly underestimated. They estimated that the average fifth grader may encounter more than 10,000 new words during the school year and that the average child in elementary or secondary school probably learns 2,000–3,000 words per year. By high school, he or she knows 45,000 words from the more than 88,000 word families used in elementary and secondary school. Anderson and Nagy defined *word families* as groups of words in which knowing one of the words in the family helps a reader to infer the meaning of the others when encountering them in context. For example, knowing *place* helps a reader understand *replace, replacement, misplace, placing,* and so forth. Words in English expand by compounding Anglo-Saxon base words and by adding prefixes and suffixes to Anglo-Saxon base words and to Latin roots and Greek combining forms. These affixed words prevail in content area reading.

Corson suggested that the human brain may use a coding system to process words and may not register multisyllabic words in their entirety: "Words may be analyzed by access codes into units, consisting of their bases or stems with prefixes and suffixes stripped" (1985, p. 19). He noted, also, that almost all words that are content specific (i.e., coming from science, social studies, mathematics, and other content areas), disregarding foreign phrases and slang terms, are of Latin and Greek origin. He suggested that these content-specific "specialist" words enter the child's "performance" vocabulary, if at all, at adolescence. The roots should be part of the curriculum, he recommended, because students from some social groups may not learn these in the natural environment. He stated that "for common readers, without Latin or Greek, the more serious reading becomes remote or irritating because the language of the page is not the language of the vernacular" (p. 39).

Beck, McKeown, and Kucan (2002) wrote of categories of vocabulary that they called "vocabulary tiers." Tier 1 includes basic words that rarely need to be taught, such as *hair, always, dress,* and *grass.* Tier 2 contains high-frequency words that are important for capable language learners to have in their vocabulary, such as *remorse, distinguished, capricious,* and *devious.* Low-frequency words, usually specific to an academic domain and best learned in the related content area, make up Tier 3. Such words include *isotope, photosynthesis,* and *psychologist.* Note that the words in these three tiers are of Anglo-Saxon, Latin, and Greek origin, respectively.

BEYOND PHONICS

Consider Alan, an extremely bright seventh-grade student just beginning secondary school. Alan struggled with reading and spelling in the elementary grades, but because of extremely high IQ scores, he was able to compensate for his problems and complete sixth grade with only moderate difficulty. Because of severe spelling problems, he was tested by a clinical psychologist at age 12; his paragraph writing to dictation appears in Figure 7.1. (Figure 7.2 provides the correct spelling of the passage.)

Teachers gain a rich source of information regarding a student's phonological abilities, orthographic understanding, and knowledge of corresponding rules by looking at the student's writing samples. Look at all of the clues available from Alan's spelling. Notice that Alan seemed to understand grapheme–

Figure 7.1. Spelling from dictation by Alan, a seventh-grade dyslexic student.

Truly, the hour when he was compelled to develop a composition seemed the longest and grimmest of the whole week. He fretted, chewed his pencil, regretted that he had not applied himself, and thought of other ways he would have preferred to spend the hour. In fact, he underwent every form of suffering except that which involves work. Finally, controlling his thoughts with an almost heroic effort, he ceased pitying himself and produced the weekly masterpiece.

Figure 7.2. Correct spelling of dictation paragraph. This paragraph was created and used by the late psychologist Margaret Rawson.

phoneme relationships: Some of his writing can be read phonetically (e.g., *comppozision* for *composition, grimist* for *grimmest*).

By the time he wrote this passage as a seventh grader, Alan had not learned many of the basic sight words needed in first and second grades, such as *hour, when, whole, ways, every, which,* and *work.* Although he did not reverse letter shapes (e.g., *b* for *d*), he did transpose the sequence of letters as in *spet.* for *Sept., exspet* for *except,* and *wrook* for *work.* Although his speaking vocabulary was outstanding, he was not consistent in his spelling: He used *-d, -de,* and *-ed* (the correct form) for the past-tense ending. The sample also shows that he did not understand the rules for suffix addition: He spelled *longest* as *longist, grimmest* as *grimist,* and *compelled* as *compeld.* Other errors include deleting a syllable, as in *sufing* (for *suffering*) and *herock* (for *heroic*).

So, where would a teacher begin instructing students with the problems that Alan showed in his writing sample? He needed some of the basic sight words, many of them nonphonetic, such as *whole, thought,* and *which.* Teachers could briefly review letter–sound correspondences and the relevant rules and then immediately begin introducing the Latin word roots and affixes.

Learning the concept of schwa would be useful for students at this point, as many of the Latin-based words contain schwa sounds as unstressed affixes are added. Understanding morphophonemic relationships, described in Chapter 3, could also benefit students with difficulties similar to Alan's. Students need to understand that as affixes are added, sounds within syllables often change but that some of the spelling patterns of the base word remain (e.g., *house, housing; know, knowledge; remedy, remediate*).

Morphological and orthographic skills are also important, especially in longer words. Teachers need to find out what their students know about morpheme patterns. One way to assess students in a classroom is to have them mark specific patterns within a list of words. A group of students can be asked to find the suffixes in words such as *imported, tractor, instructive,* and *disruption.* Or, teachers can give an individual child a card drill using common prefixes,

suffixes, or Latin roots and ask the child to read the cards and explain the meaning.

Prior to teaching the Latin roots, teachers should introduce additional prefixes and suffixes that are used with Latin roots. These affixes can be taught in separate prefix and suffix units or can be introduced as the individual roots are presented.

Prefixes

In a prefix unit, the teacher reviews those prefixes mentioned in Chapter 6 (e.g., *a-*, *de-*, *dis-*, *fore-*, *in-*, *mis-*, *pre-*, *re-*, *un-*). Then other prefixes with closed syllables are taught, such as *dif-*, *dys-*, *en-*, *ex-*, *il-*, *im-*, *in-*, *mal-*, *mid-*, *non-*, *sub-*, *suc-*, *suf-*, *sug-*, *sum-*, *sup-*, *sus-*, *trans-*, and *with-*.
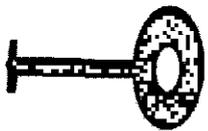
The prefix *dys-* is used with both Latin roots and Greek combining forms and contains the Greek-based pattern for *y* pronounced as short /ĭ/. The prefixes *syl-*, *sym-*, *syn-*, and *sys-* also contain *y* pronounced as short /ĭ/ and are usually taught along with the Greek combining forms.

Open-syllable prefixes include *bi-*, *co-*, *di-*, *e-*, *o-*, *pro-*, *tri-*, and *twi-*, as well as the previously taught *de-*, *re-*, and *pre-*. Prefixes with *r*-controlled vowels include *per-* and *fore-*, along with several of the two-syllable and chameleon prefixes described next. Two-syllable prefixes, including *ambi-*, *anti-*, *circum-*, *contra-*, *counter-*, *extra-*, *intra-*, *inter-*, *intro-*, *multi-*, *over-*, *super-*, and *ultra-*, should also be taught.

The chameleon prefixes (or assimilated prefixes) are generally taught when Latin roots are introduced. Assimilation denotes the process by which a sound is modified so that it becomes similar or identical to an adjacent or nearby sound (e.g., *inlegal* becomes *illegal*). The final letter of each of these prefixes changes depending on the first letter of the root. For example, *in-* (meaning *in* or *not*) changes to *il-* before a root beginning with *l* (e.g., *illegal*), to *ir-* before a root beginning with *r* (e.g., *irregular*), and to *im-* before a root beginning with *m*, *b*, or *p* (e.g., *immortal*, *imbibe*, *impede*). The prefix *con-* (meaning *together*) changes to variants *col-*, *cor-*, and *com-* in similar instances (e.g., *collect*, *correct*, *commute*, *combine*, *compute*). Other chameleon prefixes include *ad-* (*af-*, *ag-*, *al-*, *an-*, *ap-*, *ar-*, *as-*, *at-*), *sub-* (*suf-*, *sug-*, *sum-*, *sup-*), and *ob-* (*oc-*, *op-*). Teachers should tell their students that assimilation is formed due to *euphony* (from Greek *eu*, meaning *well*, and Greek *phon*, meaning *sound*). It sounds better!

Suffixes

Suffixes also need to be taught. In addition to those studied in Chapter 6 (i.e., *-able*, *-ed*, *-en*, *-er*, *-est*, *-fold*, *-ful*, *-hood*, *-ing*, *-less*, *-ling*, *-ly*, *-ment*, *-ness*, *-ship*, *-some*, and *-y*), which are used with Anglo-Saxon base words, the following suffixes need to be learned in approximately the order listed (i.e., column I prefixes are taught first, column II second, and column III last):

I	II	III
-ion (-tion, -sion)	*-ar*	*-ism*
-most	*-ability*	*-ious*
-ous	*-ible, -ibility*	*-ory*
-or	*-ize*	*-ial (-cial, -tial)*
-ess	*-ary*	*-ian (-cian)*
-ure, -ture	*-ate*	*-cious*
-dom	*-ward*	*-ation*
-ent, -ence	*-age*	*-ial (-tial)*
-an	*-al*	*-tious*
-ant, -ance	*-ify*	*-ile*
-ist	*-ity*	*-ade*
-ic	*-ee*	*-ium*
-ty	*-fy*	

(For lists of prefixes and suffixes, along with their meanings and/or grammatical information and examples of words, see Appendices D and E, respectively.)

The final spelling rule must be learned at this time:

Doubling rule (for polysyllabic base words): When a base word ends with one consonant preceded by one short vowel, double the final consonant if the final syllable in the base word is accented, as in the following examples:

- *ad/mit'*: admitting, admitted (accent is on the final syllable in the base)

- *gar'/den*: gardening, gardened (accent is on the first syllable in the base, no doubling necessary)

- *con/fer'*: conferring, conference (accent is on the final syllable in the base, but note the shift in accent in *conference*)
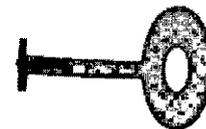
Although the past-tense forms of words such as cancel and travel traditionally have only one *l* in American English

(e.g., *canceled, traveled*), newer dictionaries are giving two spellings (e.g., *canceled* or *cancelled; traveled* or *travelled*).

Here are some other interesting guidelines about suffixes:

- Use -*or* with Latin roots for nouns (as in *inventor, conductor, elevator*), but use -*ar* for adjectives (as in *popular, singular, circular*).
- Use -*or* with Latin roots (as in *spectator*), but use -*er* for Anglo-Saxon roots (as in *heater, swimmer, baker*)
- Although -*ous* and -*ess* sound alike because both are unstressed syllables that contain a schwa sound, use -*ous* for adjectives (as in *dangerous, tremendous*, and *fabulous*) and -*ess* for feminine nouns (as in *princess, hostess*, and *governess*). The similar sounding -*ice* is a noun suffix (as in *office, malice, practice*, and *apprentice*).
- Use -*est* for the comparative degree of adjectives (as in *greenest, loveliest, smallest*), but use -*ist* for people nouns (as in *dentist, pianist, socialist*)
- Although not always the case, -*able* is usually added to Anglo-Saxon base words (as in *likable, reasonable, eatable*) and -*ible* is usually added to Latin roots (as in *credible, edible, impossible*).
- Although -*ent* and -*ant*, as well as -*ence* and -*ance*, sound alike because of the schwa, -*ent* and -*ence* are used somewhat more often than -*ant* and -*ance*. If in doubt, before you check the dictionary or spell checker, use -*ent* or -*ence*. Also, the suffix -*ant* often indicates a person noun (as in *tenant, sergeant, complainant*).

> When working with morphemes, be sure that students are not finding "false" morphemes in words. For example, students should not conclude that *sister* contains the comparative suffix -er or that *hundred* contains the past-tense suffix -ed. Students can consult the dictionary for etymologies together or independently to clear up confusion.

LATIN ROOTS

Teach each Latin root directly. Remember that the spelling of each Latin root is reliable in scores of words. Edmund H. Henderson reminded us that the Latin roots and Greek combining forms are stable elements of word knowledge and that "they are like the meaning characters in Chinese and Japanese.

They provide meaning efficiency for reading across a shifting surface of sound" (1990, p. 74).

As students begin to learn the Latin roots, the teacher should incorporate etymology study in the curriculum. Etymology involves the history of words and the development of the structures and meanings of words. Corson said that "marked educational improvements have been reported for children who have followed programmes focusing on the etymology and word relationship of English" (1985, p. 28). Students learn to analyze the etymology of a word by looking in the dictionary. For example, students can look up the word *inspire* in the fourth edition of *The American Heritage Dictionary* (2000). They will find an etymology that shows that the word goes back to the Latin and prefixes the root *spir* with *in-*. Teachers can ask students to use a thesaurus to find synonyms of *inspire* or can ask them to generate other words with the root *spir.*

The sequence of presentation of Latin roots is based on both the frequency of words and the regularity of spellings. The first roots learned have only one or two forms (e.g., *tract; dic, dict; stru, struct*). Next, roots with three and four variants (e.g., *duc, duce, duct; fac, fact, fect, fic*) can be learned. Two or three groups of roots can be taught in each lesson. The teacher should give ample opportunities for students to generate words and to read and spell them in lists, phrases, and sentences. (See the end of this chapter for other practice activities.)

Here is one logical sequence for presentation, reading across rows. See Appendix F for the Latin roots, their meanings, and examples of words. (Brown [1947] suggested that the 12 Latin roots marked by asterisks, along with the Greek combining forms *graph* and *ology*, provide the clues to the meaning of more than 100,000 words.)

form (to shape)	*port* (to carry)
rupt (to break or burst)	*tract* (to draw or pull)
scrib, script (to write)*	*spec, spect, spic* (to see, watch, or observe)*
stru, struct (to build)	*dic, dict* (to say or tell)
flect, flex (to bend or curve)	*mit, miss* (to send)*
fer (to bear or yield)*	*cred* (to believe)
duc, duce, duct (to lead)*	*pel, puls* (to drive or push)
vers, vert (to turn)	*pend, pens* (to hang or weigh)
fac, fact, fect, fic (to make or do)*	*jac, jec, ject* (to throw or lie)
tend, tens, tent (to stretch or strain)*	*cur, curs* (to run or go)
ped (foot)	*vid, vis* (to see)
aud (to hear or listen)	*vit, vita, viv, vivi* (to live)

leg (law)

capit, capt (head or chief)

cap, ceit, ceive, cep, cept, cip (to take, catch, seize, hold, or receive)*

voc, vok, voke (to call)

lit, liter, litera (letters)

ten, tain, tin, tinu (to hold)*

sist, sta, stat, stit (to stand)*

pon, pose, pound (to put, place, or set)*

mob, mot, mov (to move)

cide (to kill)

plic, ply (to fold)*

greg (group, crowd, flock, or herd; to assemble)

spir, spire (to breathe)

grad, gred, gress (step, degree; to walk)

lect, leg, lig (to choose, pick, read, or speak)

cede, ceed, cess (to go, yield, or surrender)

feder, fid, fide, feal (trust or faith)

cad, cas, cid (to fall or befall)

cern (to separate), *cert* (to decide)

gen, genus (race, kind, or species; birth)

cise (to cut)

Because the spellings of Latin roots are so phonetic, the teacher may present them in almost any order. The teacher may wish to determine which roots are found in the literature and textbooks that his or her students read and develop a customized sequence.

The teacher can ask students to generate morpheme webs using roots as they are presented. Ramsden (2001) illustrated this web activity (see Figure 7.3). Matrices are also good visual reinforcement for many roots. Again, Ramsden (2001) illustrated such a matrix that shows the affixes that can be added to a target root (see Figure 7.4).

The teacher should consciously direct students to the spelling–meaning connection. Remember that accent often shifts and that vowel sounds become schwa. The teacher should show the relationship of word families. For example, the teacher can help students notice that in *sign*, the *g* is not heard that but in *signal, signify*, and *signature*, the *g* gets its hard sound. Student can be asked to compare the vowel sounds in the following words: *melody, melodic*, and *melodious*. In *melody*, the *o* is pronounced as schwa; in *melodic* the *o* says short /ŏ/, and in *melodious* the *o* says long /ō/. Similar compare/contrast examples can include word pairs such as *condemn, condemnation; compete, competition; image, imagine;* and *local, locality*. Students should mark the accent and vowel sounds in each word.

The teacher should point out to students that some Latin roots require "connectives" between the root and the suffix. The *u* in *contemptuous* is a connective, as is the *i* in *solitude*. Other examples, with connectives underlined, include *monument, familiar, conspicuous, convenient, ingenious,* and *editorial*.

After students learn several Latin roots, the teacher connects these roots to content area reading to ensure transfer. The teacher selects phrases or sentences from a social studies text that contain words with the target roots. Students read or write the selected groups of words. (See Appendix H for content area words related to upper elementary and middle school subject areas.)
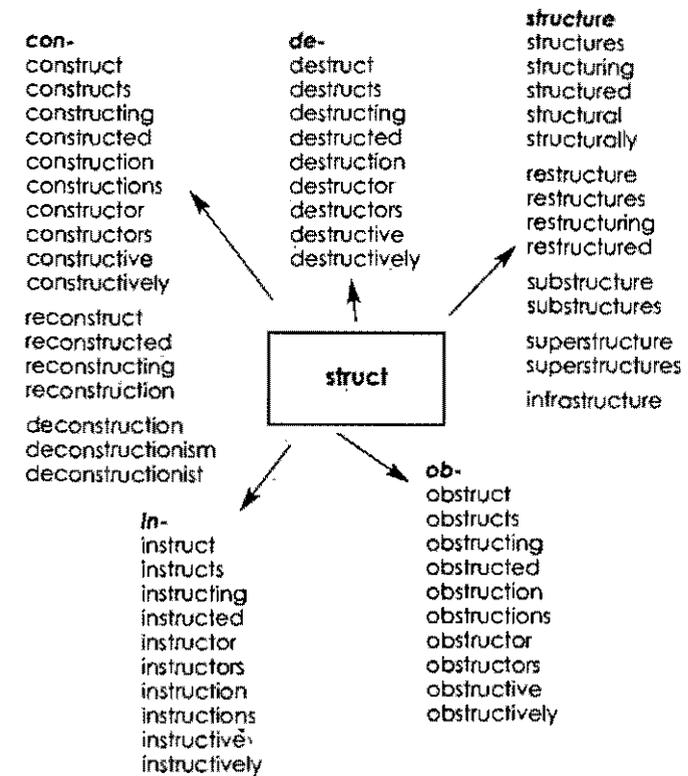
Figure 7.3. Morpheme web for the root *struct*. (From Ramsden, M. [2000]. *The user's self-training manual: The essential reference for real English spelling* [Available from the author, http://perso.wanadoo.fr/melvyn/spelling/manual.html]; adapted by permission.)

While working with the Latin word roots, the teacher should remember that the affixes generally contain the schwa sound. Students cannot depend only on phonological clues for decoding and spelling these multisyllabic words and must know grammatical usage as well. Remember, for example,

Figure 7.4. Affix matrix for the root *struct*.

that in spelling the word *governess*, students need to know that both *-ous* and *-ess* say /əs/. But knowing that *-ess* is used for feminine nouns and that *governess* is a feminine noun, whereas *-ous* is used only for adjectives (e.g., *mountainous*, *adventurous*), brings students to the correct solution.

WORD WISDOM:
THE INFLUENCE OF FRENCH ON ENGLISH

Many English words are influenced by the French language. For example, most words with the grapheme *ch* sounding like /sh/ come from French:

chef	cache	chenille	chamois
machine	mustache	sachet	brochure
champagne	chute	chiffon	parachute
chandelier	chivalry	nonchalant	chauvinist

Many French-based words include the grapheme *ou*:

adjourn	sojourn	journey	journal
flourish	courage	encourage	nourish
courier	couple	courtesy	courteous

The spelling pattern *eau* is also a convention from French:

flambeau	bandeau	rondeau	tableau
trousseau	bureau	chateau	plateau

In addition, the word-final *-que*, sounding like /k/, is from French:

oblique	antique	technique	pique
perique	physique	unique	critique
clique	cinque	baroque	equivoque
Basque	masque	arabesque	Romanesque
humoresque	picturesque	grotesque	

LESSON: INTRODUCING LATIN WORD ROOTS

Opening

"Today we're going to continue breaking words apart to make them easier to read and spell. We've worked on Anglo-Saxon root words and nu-

merous prefixes and suffixes. For the next several days, we will talk about Latin roots. Who remembers what a root is?" [*The root is the main part of the word, the part to which prefixes and suffixes are added. The root usually receives the accent or stress in Latin-based words.*] "Roots are valuable not only as patterns for decoding and spelling but also for learning new vocabulary to enhance your reading, writing, listening, and speaking. Thousands of words—more than half of the words in the dictionary—come from Latin roots. Each root has a specific meaning; we change the meaning by adding prefixes and suffixes."

Middle

Write the root *rupt* on the board. Ask students to generate a number of words with *rupt* as the root. Write the words on the board. See if students can pick up the meaning of *rupt* (to break, to burst) from the words on the board. Here are some words containing *rupt*:

rupture	abruptly	erupt	eruption	eruptive
abrupt	interrupts	interrupting	interrupted	interruption
disrupt	disruptive	disrupted	corrupt	corruptible
corrupted	corrupting	corruption	irrupt	bankrupt

Add additional words containing *rupt* and affixes. For each word, have students read the word and identify the common word part (*rupt*). Have students note the placement of the root (at the beginning if there is no prefix, the end if there is no suffix, the middle if there are prefixes and suffixes).

Dictate several words containing *rupt* and sentences containing these words.

Closing

Probe for content, structure, and process. Review why learning these roots is valuable for students.

Follow-up

Have students look for words of Latin origin in newspapers or in their social studies textbook.

In a format similar to this lesson, continue to present new, frequently used roots, such as *port* (to carry); *form* (to shape); *tract* (to pull); *stru, struct* (to build); *dic, dict* (to say, tell); *flect, flex* (to bend); *mit, miss* (to send); *fer* (to bear, carry); and so forth.

From Henry, M.K. (1990). *WORDS: Integrated decoding and spelling instruction based on word origin and word structure* (p. 44). Austin, TX: PRO-ED; and Henry, M.K., & Redding, N.C. (1996). *Patterns for success in reading and spelling* (pp. 251–252). Austin, TX: PRO-ED; adapted by permission.

GREEK COMBINING FORMS

Many of the Latin roots were actually borrowed from Greek. Some of the Greek words had themselves been borrowed from the language of still earlier people, the Phoenicians. The Greek-based words in English tend to be related to math and science. Words such as *biology, geology, archaeology, physics, chemistry,* and *geography* all contain Greek combining forms, and the words used in these domains are often of Greek origin.

Teachers may want to complete the majority of Latin roots before presenting the Greek combining forms. Or, teachers may wish to teach some of the common Greek forms along with the Latin roots, especially in fifth grade, during which science and math texts begin to depend on Greek-based words as the key content words.

When introducing Greek-based words, first teach those letter–sound correspondences that are exclusive to Greek (i.e., *ph* for /f/ as in *photograph, ch* for /k/ as in *chemotherapy,* and *y* for /ĭ/ as in *symphonic*). Other Greek-based letter combinations include *y* as long /ī/ as in *hydrogen, ps* as in *psychology, rh* as in *rhinoceros, pn* as in *pneumonia, pt* as in *pterodactyl,* and *mn* as in *mnemonic.* If a word begins with *x*, students can assume it is from Greek, as in *xylophone* and *Xerxes.*

Because Greek-based word parts compound, the parts are usually called *combining forms.* Some teachers, however, use the term *root,* which is fine as long as the term is used consistently. Note also that some teachers use the term *prefix* for Greek combining forms that appear at the beginnings of words (e.g., *auto, tele*) and the term *suffix* for those forms appearing at the ends of words (e.g., *ology, logue*). Again, this is fine as long as the terms are applied consistently.

Give approximately four to six Greek combining forms in any lesson. This way, scores of words can be generated from each combining form. A possible sequence for presenting the Greek combining forms, based primarily on grade level and frequency, follows, reading across rows:

phon, phono (sound)	*photo* (light)
gram, graph (written or drawn)	*auto* (self)
tele (distant)	*logy* (study; from *logos, logue* [speech or word])
micro (small or minute)	*meter, metr* (measure)
therm, thermo (heat or hot)	*bio* (life)
scope (to watch or see)	*hydr, hydra, hydro* (water)
biblio (book)	*cracy, crat* (rule)
geo (earth)	*metro* (mother city; measure)
pol, polis, polit (city; method of government)	*dem, demo* (people)
derm (skin)	*hypo* (under)
chron, chrono (time)	*cycl, cyclo* (wheel or circle; circular)
hyper (over, above, or excessive)	*chrom* (color)
phys (nature)	*techn* (skill, art, or craft)
path (feeling, suffering, or disease)	*psych* (mind or soul)
lex (word)	*gno, gnosi* (know)
mega (large or great)	*mech* (machine)
meta (beside, after, later, or beyond)	*arch* (chief or ruler)
kine, cine (movement)	*phil, phila, phile, philo* (love or affinity for)
the, theo (god)	*soph* (wisdom or cleverness)
mania (madness, frenzy, abnormal desire, or obsession)	*phobia, phobic; phobe* (irrational fear or hatred; one who fears-hates)
ast, astro (star)	*andr, anthr* (man)
archae, arche, archi (primitive or ancient)	

A combined unit on Latin- and Greek-based number words is recommended for the upper-grade students, as the terms appear over and over in math and science textbooks at this level. (See the section in Appendix D called "Number Prefixes from Latin and Greek" for the related number words.)

LESSON: INTRODUCING GREEK COMBINING FORMS

Opening

"Today we will switch from working on words of Latin origin to learning words of Greek origin. You may remember that these words are often used in science classes and textbooks. Different people use different terms to de-

ultra-	[C]	A. between
contra-	[E]	B. around
intro-	[D]	C. beyond
inter-	[A]	D. inward
intra-	[F]	E. against
circum-	[B]	F. within

Matching Suffixes and Meanings

Students match suffixes and their parts of speech.

-or	[C]	A. adverb
-ess	[D]	B. adjective
-ist	[E]	C. noun
-ly	[A]	D. feminine noun
-ous	[B]	E. noun, person

Finding Morphemes in Words

Students read the following words and list the root and any prefixes and/or suffixes. Analyze the following Latin-based words for word structure and pronunciation.

Word	Prefix(es)	Root	Suffix(es)
reflection	[re]	[flect]	[ion]
disrupted	[dis]	[rupt]	[ed]
attractive	[at]	[tract]	[ive]
collective	[col]	[lect]	[ive]
subtracting	[sub]	[tract]	[ing]
prescriptions	[pre]	[script]	[ion, s]
reconstructionist	[re, con]	[struct]	[ion, ist]
pendant	[no prefixes]	[pend]	[ant]
congregation	[con]	[greg]	[ation]
inspector	[in]	[spect]	[or]

Finding Latin Roots

Have students underline the Latin word roots in the following words:

nondescript	instructive	convertible	conference
attractive	adversary	unintentionally	conductor
expelled	spectacular	reflection	conjecture

Matching Roots and Meanings

Students match the Latin root with the letter of the correct meaning:

[C]	rupt	A. to say or tell
[F]	spect	B. to breathe
[A]	dict	C. to break or burst
[E]	flect	D. to pull
[B]	spire	E. to bend
[D]	tract	F. to see

Matching Words and Meanings

Ask students to match the correct meaning with each word containing the root dic, dict (meaning to say or tell)

[F]	malediction	A. an absolute ruler
[D]	benediction	B. to express the opposite
[B]	contradict	C. to point out
[G]	prediction	D. a blessing
[A]	dictator	E. a reference book for words
[C]	indicate	F. a curse
[E]	dictionary	G. something foretold

Defining Roots

Students write the Latin root that corresponds with each of the following:

to pull [tract]	to build [struct]
to write [scribe or script]	to bend [flect or flex]
to see [spect]	to break [rupt]
to hear [aud]	to run [cur or curs]
to stretch [tend or tens]	to turn [vert or vers]
to believe [cred]	to bear [fer]

Identifying Affixes

Ask students to underline the prefixes and circle the suffixes in the following passage.

The active conductor took the elevator to the fifth floor. There he walked briskly to the composer's attractive apartment. Mr. Musician, the conductor, was furious that Mr. Composition had forgotten to deliver the latest manuscript to the auditorium for the rehearsal.

Mr. Musician: "How can the orchestra possibly play this piece at tonight's performance? We have been unable to rehearse. The violinists are fuming, the trombonists are seething, and the percussionists are almost insane."

Mr. Composition: "The latest corrections have been included in this final draft. Your musicians are so talented and precocious they can play anything. Take this folder containing the symphony and leave me alone!"

Finding Target Morpheme Cards

Using 3 × 5 cards with prefixes, roots, and suffixes on them, ask students to find target cards, such as the cards that mean before, against, build, turn, and so forth (pre, ante, struct, vert).

Using Words in Context

Ask students to write each word in a sentence:

exports   [The United States exports grain to many countries.]
bankrupt   [Numerous companies may go bankrupt during a recession.]
transformed   [The darkness transformed our memory of the forest.]

Filling in the Blanks

Ask students to fill in the missing word in each sentence with the best word from the following choices:

interrupted	information	formality	convertible
spectators	supported	report	formula

My _____ card had mostly As.   [report]
My sister _____ our telephone conversation.   [interrupted]
The building was _____ by heavy beams.   [supported]
Give me new _____ on the research.   [information]
I have a new yellow _____.   [convertible]
The _____ cheered at the football game.   [spectators]

Substituting Latin-Based Words

For each italicized word or phrase, students choose a substitute term from the three choices given. This substitute term should contain a Latin-based root.

My teacher helped the principal at lunchtime.
    informer   [instructor]   reporter

Turn in your research paper tomorrow.
    [manuscript]   prescription   protractor

Sign the business agreement soon.
    [contract]   inscription   export

He had a new mathematical equation to study.
    informal   conductor   [formula]

Adding Suffixes

Review the doubling rule for polysyllabic base words. Ask students to underline the accented syllable in the following base words, and write the word with the given suffix added:

construct + ed [constructed]	commit + ee [committee]
expel + ing [expelling]	admit + ance [admittance]
govern + or [governor]	summon + ed [summoned]
prevent + ive [preventive]	forbid + en [forbidden]

Identifying Language of Origin

Have students identify the origin languages (Anglo-Saxon, Latin, or Greek) of the following words:

philharmonic [Greek]	psychology [Greek]
extraction [Latin]	hopelessness [Anglo-Saxon]
introspective [Latin]	laughing [Anglo-Saxon]
bookish [Anglo-Saxon]	manufactured [Latin]
expeditious [Latin]	hydrophobia [Greek]

Finding Greek Combining Forms

Students circle the Greek combining forms in the following words:

chronology	microscope	telegraph	hydrosphere
polygon	monogram	thermometer	philosophy

Matching Combining Forms

Students match the letter of the correct meaning with the Greek combining form.

[F]	micro	A. sound
[G]	ology	B. life
[D]	auto	C. look or see
[J]	graph, gram	D. self
[I]	therm	E. distant
[E]	tele	F. small
[B]	bio	G. study
[A]	phon, phono	H. water
[C]	scope	I. heat
[H]	hydro	J. written or drawn

Identifying Parts of Speech

Ask students to give the part of speech (noun, verb, or adjective) for each word:

geology [noun]   geologist [noun]

geologize [verb]   geologizer [noun]

geologizing [noun]   geologic [adjective]

geological [adjective]   geologically [adverb]

geologian [noun]

Making Words

Give pairs of children a Greek-based word with two combining forms, such as biology. Have the students identify the two combining forms, bio and logy; give the forms' meanings; and make words with those two forms.

biology

bio (life)   logy (study of)

biosphere   geology

biodegradable   dermatology

biochemistry   phonology

biography   zoology

autobiography   pathology

                                  mythology

Finding Words in Context

Astro is a Greek combining form meaning star. Ask students to find as many astro words as possible in their science book, in the dictionary; or on the Internet. [astrophysics, astrochemistry, astrobiology, astrogeology, and so forth]

Making Morpheme Webs

Ask students to draw a web for the root rupt, using the blank web shown in Figure 7.5 as a model. Students should use as many prefixes and suffixes as they can. This can be a group or individual activity.
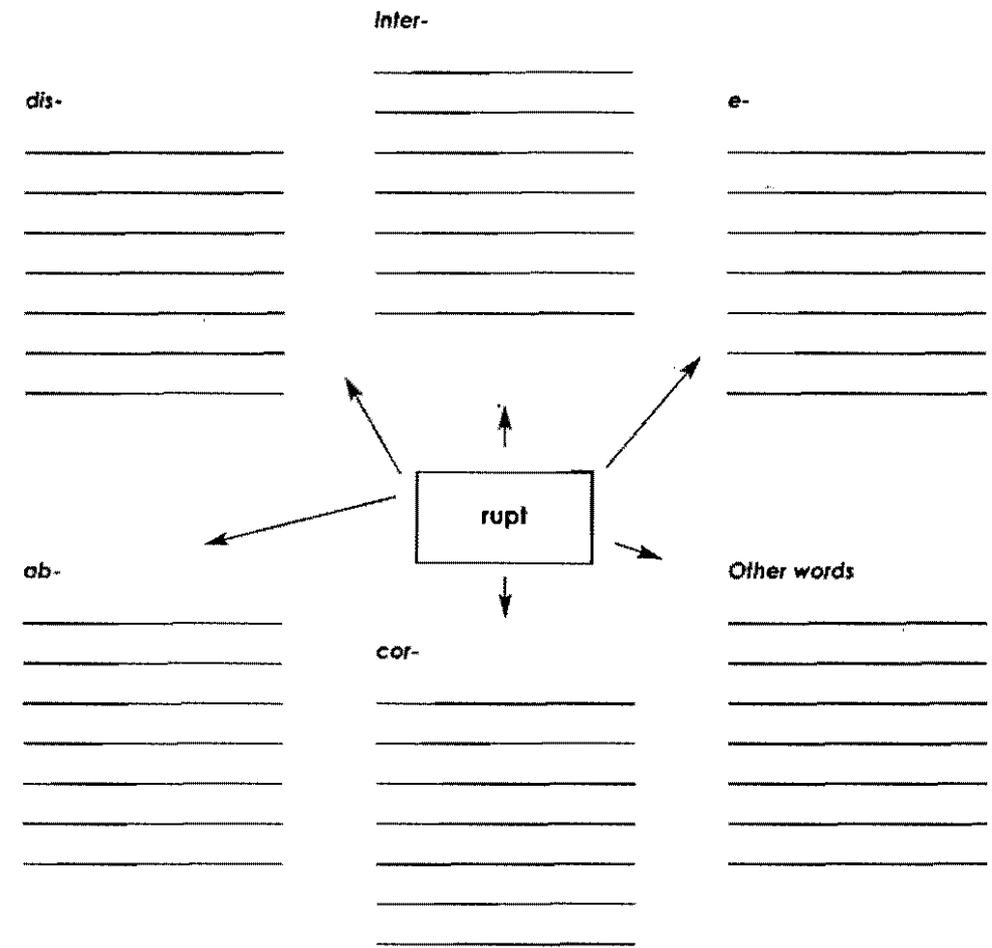

Figure 7.5. Blank morpheme web for the root rupt.

Brainstorming Greek-Based Words

Students write as many words containing each Greek combining form as they can. This can be a group or solo activity.

micro

chron

photo

Guided Questioning

Have students answer the following types of questions about words of interest:

photosynthesis: "What is the word's origin? [Greek] What are the clues?" [The letters ph saying /f/ and y saying /ī/] "What do you think this word means? What is the dictionary definition?"

interruption: "What is the word's origin?" [Latin] "What are the clues?" [prefix inter-, root rupt, suffix -ion] "What is the meaning?" [a hindering or stopping of some action by someone breaking in] "What is the literal definition?" [to break between]

Contrasting Meaning

Have children contrast word pairs, as in the following examples. Students should try to figure out the meaning of the target words and can check their answers by using the dictionary. This is a good activity for small groups of students working together.

"Describe a person with *megapods* and *megadonts*." [A person with megapods and megadonts has large feet and large teeth.]

"Compare the behavior of an *extrovert* and an *introvert*." [An extrovert is outgoing and gregarious, whereas an introvert turns inward.]

"How do *intrastate* and *interstate* highways differ?" [Intrastate highways exist within a state, whereas interstate highways run between states.]

Playing Word Games

Games are useful for reinforcing concepts learned. Activities based on popular games such as Bingo, Concentration, Jeopardy!, Wheel of Fortune, and Charades can be adapted to practice with word roots and combining forms.

WORD WISDOM: THE LETTER *i* AS CONSONANT /y/

When the letter *i* comes after *ll* or word-medial *l* or *n*, the *i* is often pronounced as the consonant sound /y/:

alien	familiar	civilian	peculiar
billiards	million	billion	trillion
bunion	companion	onion	union

RESOURCES FOR TEACHERS

Bebko, A.R., Alexander, J., & Doucet, R. (n.d.). *LANGUAGE!: Roots* (2nd ed.). Longmont, CO: Sopris West.

Blanchard, C. (n.d.). *Word root series* (Level A: grades 4–6, Level B: grades 7 to adult). Pacific Grove, CA: Critical Thinking Books and Software.

Ehrlich, I. (1988). *Instant vocabulary* (Reissue ed.). New York: Pocket Books.

Fifer, N., & Flowers, N. (1990). *Vocabulary from classical roots.* Cambridge, MA: Educators Publishing Service.

Henry, M.K. (1990). *WORDS: Integrated decoding and spelling instruction based on word origin and word structure.* Austin, TX: PRO-ED.

Henry, M.K., & Redding, N.C. (1996). *Patterns for success in reading and spelling.* Austin, TX: PRO-ED.

Johnson, K., & Bayrd, P. (1998). *Megawords series.* Cambridge, MA: Educators Publishing Service.

Marcellaro, E.G., & Ostrovsky, G.R. (1988). *Verbal vibes series.* Sacramento, CA: Lumen Publications.

Michaels, B., & Laurita, R.E. (Eds.). *The Spelling Newsletter.* (Available from the editors, Post Office Box 1326, Camden, ME 04843)

Morgan, K. (2002). *Dynamic roots.* Albuquerque, NM: Morgan Dynamic Phonics.

Quinion, M. (2002). *Ologies and isms: Beginnings and endings of words.* Oxford, England: Oxford University Press.

Rome, P.D., & Osman, J.S. (2000). *Advanced language tool kit* [Teacher's manual and cards]. Cambridge, MA: Educators Publishing Service.

Steere, A., Peck, C.Z., & Kahn, L. (1971). *Solving language difficulties.* Cambridge, MA: Educators Publishing Service.

Wimer, D.B. (1994). *Word studies: A classical perspective. Vol. 1: Prefixes + roots + suffixes.* Richmond, VA: Author. (Available from the author, Post Office Box 5362, Richmond, VA 23220)

Dictionaries and Thesauri

The American Heritage Student Dictionary (for grades 6–9). (1998). Boston: Houghton Mifflin.

The American Heritage Student Thesaurus (for grades 7–10). (1999). Boston: Houghton Mifflin.

Barnhart, R.K. (Ed.). (1988). *The Barnhart dictionary of etymology*. New York: The H.W. Wilson Company.

Bollard, J.K. (1998). *Scholastic children's thesaurus*. New York: Scholastic.

Crutchfield, R.S. (1997). *English vocabulary quick reference: A comprehensive dictionary arranged by word roots*. Leesburg, VA: LexaDyne Publishing. (Also available on-line: http://www.quickreference.com/order.htm)

Halsey, W.D. (Ed.). (2001). *Macmillan dictionary for children*. New York: Simon & Schuster.

Latimer, J.P., & Nolting, K.S. (2001). *Simon & Schuster thesaurus for children* [ages 9–12]. New York: Simon & Schuster.

Web Sites

Critical Thinking Books and Software, www.criticalthinking.com

Explore English Words by Focusing on Words, www.wordexplorations.com

Morgan Dynamic Phonics, www.dynamicphonics.com

World Wide Words, www.worldwidewords.org/index.htm

GAME FOR STUDENTS

Johnson, P.F. (1999). *Word Scramble 2*. East Moline, IL: LinguiSystems.