

WORDS WITH SPELLING CONNECTIONS HAVE MEANING CONNECTIONS

PHONOLOGY + PHONICS + MORPHOLOGY + ETYMOLOGY = ORTHOGRAPHY

➔FOUR CONVERGING PATHS EN ROUTE TO AUTOMATIC WORD RECOGNITION AND SPELLING◀

Nancy Cushen White, Ed.D.

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www.realspelling.com

“...orthography is human thought—and experience—
made visible as text.”

Gina Cooke

Linguist Educator Exchange—LEX
<http://linguisteducatorexchange.com>

“... graphemes whisper to us of ways our long-ago
forebears perceived and spoke about their world.”

Pete Bowers

www.wordworkskingston.com

English spelling is a well-ordered, reliable system
we can investigate and understand
through problem-solving.

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Bruner's Law

“We want kids to experience success and
failure as information—not success or failure.”

—Jerome Bruner

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Orthography

Etymology + Morphology + Phonics + Phonology

◆ Etymology ➔ interrelationships of words with
their own origins and with other words that share
that origin

◆ Morphology ➔ sequence and structure of
meaningful units

◆ Phonology ➔ units of speech that create meaning
when combined

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Etymology

INTERRELATIONSHIPS

- Words with their origins
- Other words with the same origin

French ➔ coquette, antique, contour

Italian ➔ piano, Monticello

Yiddish ➔ chutzpah, schlock

Spanish ➔ mesa, taco

Greek ➔ polychrome, philosophy

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A BIG Idea

❖ Words with spelling connections also have
meaning connections.

❖ The meaning of a word is the sum of its parts.
80% of derived words mean what their parts
suggest—IF multiple meanings of the base
elements are taken into account.

❖ Students who understand language structure
notice and use these links in meaning.

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→ FOUR CONVERGING PATHS EN ROUTE TO AUTOMATIC WORD RECOGNITION AND SPELLING ←

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Morpheme → smallest meaningful unit of language

Count the morphemes in these words:

- elephants
- *election
- *accommodation
- *interrelationship
- photograph
- idiosyncratic
- beneficial
- conscious

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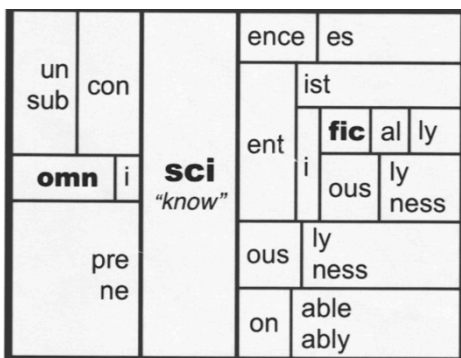
Another **BIG** Idea

❖ Words with spelling connections also have meaning connections.

❖ know the pronunciation of a base until it surfaces in a word.

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Base Element → **<sci>**
Melvyn Ramsden—*Real Spelling* www.realspelling.com



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Morphology

Morpheme → smallest unit of meaning

➤ Linguistic Entity → whole word → part of a word → single phoneme

* <u>accept</u>	<u>except</u>
<u>elicit</u>	<u>illicit</u>
<u>affect</u>	<u>effect</u>
* <u>fiscal</u>	<u>physical</u>
<u>specific</u>	<u>pacific</u>
con <u>scious</u>	con <u>science</u>
* <u>dentist</u>	swif <u>test</u>
* <u>hostess</u>	fam <u>ous</u>
spectroheliograph	

Roots-Base Elements-Stems

Roots → Etymological or Morphological?

❖ **Strictly** historical term (diachronic)

❖ Currently used as exclusively etymological

❖ Etymological source of the base element

Roots-Base Elements-Stems

EXAMPLES OF ROOTS

The root of <ugly> is the Old Norse <uggligr> which means "to be feared."

➤ The root of <gregarious> is the Latin <gregem> which means "flock."

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Roots-Base Elements-Stems
EXAMPLES OF ROOTS➔ Eponyms
Eponym ➔ a word derived from the <u>name</u> of a <u>person</u>
<ul style="list-style-type: none"> ⊙ sandwich➔The Earl of Sandwich was a compulsive gambler—who did not want to stop gambling when he was hungry. ⊙ atlas➔Atlas was a second-generation Titan who personified the quality of endurance. He led the Titans in a rebellion against Zeus and was condemned to bear the heavens upon his shoulders. Illustrations on covers of early books of maps showed Atlas holding up the globe; hence, today a book of maps is called an atlas

Roots-Base Elements-Stems
EXAMPLES OF ROOTS➔ Toponyms
Toponym ➔ a word derived from the <u>name</u> of a <u>place</u>
<ul style="list-style-type: none"> ⊙ The root of <fez> is <fez>. This word, meaning cylindrical red headgear with a tassel, is named after the Moroccan city of Fez. ⊙ Examples of Toponyms: <ul style="list-style-type: none"> ➢ hamburger ➢ cologne ➢ fez

Roots-Base Elements-Stems
EXAMPLES OF ROOTS➔ Toponyms
Toponym ➔ a word derived from the <u>name</u> of a <u>place</u>
<ul style="list-style-type: none"> ⊙ <la la land> <ol style="list-style-type: none"> 1. A place or a state of being out of touch with reality 2. A place known for frivolous activities. <p>The term <la-la land> is coined from the initials of the city of Los Angeles, home of Hollywood, alluding to the fictitious nature of the movies, sets, etc.</p>

Roots-Base Elements-Stems
Base Element
❖Essential <u>kernel</u> of a word's meaning
❖Morphological base of a word
❖No inherent historical reference
❖Strictly structural connotation
❖Spelling of a word as it is today

Roots-Base Elements-Stems
Base Element
No inherent historical reference
Morphological base of a word
Essential <u>kernel</u> of a word's meaning
Spelling of a word as it is today
Strictly structural connotation

Roots-Base Elements-Stems
Base Elements
<ul style="list-style-type: none"> ❑ Free Bases can function as single words independently. will the text she with run warm ❑ Bound Bases are only words in combination with at least one other element. ject rupt chrone phys fer tain sci ❑ Twin Bases have alternative forms. scribe-script tend-tense duce-duct flex-flect <ul style="list-style-type: none"> ○ Any or all <u>may</u> appear in the same word family. ❑ Different Bases derived from the <u>same</u> root: same etymological family—different morphological family face-fice-fact-fect➔to make tain-tent-tine-tene➔to hold

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Free Morphemes-Bases

- ❑ Can stand alone as words
- ❑ Do not have to be combined with other morphemes
- ❑ May be made up of one or more syllables

FUNCTION WORDS

- conjunctions
- prepositions
- pronouns
- helping verbs
- articles

CONTENT WORDS

- nouns
- verbs
- adjectives
- adverbs

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Function Words

- ❑ Have little meaning of their own
- ❑ Give information about the function of lexical [content] words
- ❑ Are the main concern of grammar books
- ❑ Are usually unstressed (unaccented)

FUNCTION WORDS

- conjunctions
- prepositions
- pronouns
- helping verbs
- articles

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Content [Lexical] Words

- ❑ Have denotation, or specific meanings
- ❑ Can be defined in isolation
- ❑ Are the principal concern of dictionaries
- ❑ Are usually stressed [accented]

CONTENT-LEXICAL WORDS

- nouns
- verbs
- adjectives
- adverbs

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Lexical [Content] Words Must Have At Least Three Letters

odd egg err ebb

When a lexical [content] word and a function word are homophones, one more letter is used to spell the lexical word.

in	for	by	to	or	but	be	we
inn	fore	bye	too	ore	butt	bee	wee
		buy		oar			

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Lexical [Content] Words Must Have At Least Three Letters

What about one-syllable words ending in the phoneme /ɪ/?
<cry> <dry> <try> <sly> <pry> <shy>

- ◆ These words can be spelled with a <y> grapheme to represent their /ɪ/ phoneme because their spelling includes a consonant blend or consonant digraph thus providing the 3 letters required for a lexical word.

<lie> <die> <vie> <tie>

- ◆ These words cannot be spelled with the single letter <y> grapheme to represent their /ɪ/ phoneme because they start with a single consonant grapheme and therefore need an additional letter to meet the minimum of three letters required for a lexical word—so <ie> must spell /ɪ/.

Thanks to Gina Cooke for her insights on use of graphemes <y> and <ie> to spell /ɪ/.

Bound Morphemes

- ◆ Work as meaningful units ONLY in combination with other morphemes

- ◆ NEVER stand alone

◆ SUFFIXES

- ❑ Inflectional Suffixes
 - ✧ Grammatical endings
- ❑ Derivational Suffixes
 - ✧ Changes part of speech

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*Roots-Base Elements-Stems

- How do **STEMS** differ from roots or base elements?
 - *Complex words to which additional affixes can be added
 - Base element that has already acquired another element [base or affix] **AND** to which a further affix or base element can be added
 - All stems are complex words, but not all complex words are stems.

*Morphologically **Complex Word** ➔ at least two morphemes

elect = e+lect *joyful* = joy+ful *walked* = walk+ed
resist = re+sist *science* = sci+ence
anyone = any+one *rusty* = rust+y

*Morphologically **Simple Word** ➔ a single morpheme

string *baffle* *rhythm* *corner* *liver* *cyst*

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Affixes ➔ Prefixes and Suffixes

□ **Affixes** ➔ bound morphemes that generate derivations and inflections of a base element

□ **Prefixes**

- Prefixes precede base elements within words.
- A single base element may have multiple prefixes.

□ **Suffixes**

- Suffixes follow base elements within words.
- A single base element may have multiple suffixes.

□ **Connective Vowels**

- Connective vowels follow base elements within words.
- Only one connective vowel may follow a base element.

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Connective Vowels

□ **Connective Vowels** ➔

- Connective vowels follow base elements within words.
- Only one connective vowel may follow a base element.

synonym = syn + onym
thermometer = therm + o + meter
proficient = pro + fice + i + ent
situation = site + u + ate + ion
psychology = psych + o + loge + y

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Some Little-Known Orthographic Rules

[Examples Below Shared and/or Inspired by Gina Cooke]

A grapheme cannot straddle a morpheme boundary:

- There is a consonant digraph <th> grapheme in <father>.
- There is NO <th> grapheme in <fathead>:
<fat> + <head>.
- There is a double vowel <ea> grapheme in <heal>.
- There is NO <ea> grapheme in <create>:
<cre> + <ate>

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Some Little-Known Orthographic Rules

[Examples Below Shared and/or Inspired by Gina Cooke]

A grapheme cannot straddle a morpheme boundary:

There are constraints—having to do with how English handles digraphs/trigraphs next to identical letters—related to which consecutive vowels English will allow across morpheme boundaries.

- <agree> + <ed> ➔ <agreed> [NOT agreeed]
- <agree> + <ing> ➔ <agreeing>
- <eight> + th ➔ <eighth> [NOT eighthth]
- <full> + ly ➔ <fully> [NOT fullyly]

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ORTHOGRAPHIC CHANGES WHEN ADDING SUFFIXES SPELLING RULES

▪ **1-1-1 OR DOUBLING RULE**

win ➔ winning refer ➔ referral grab ➔ grabbing

▪ **SILENT e OR DROP RULE**

give ➔ giving escape ➔ escapee response ➔ responsive
confide ➔ confident promote ➔ promotion gene ➔ genius

BOUND BASES: stere ➔ sterile fine ➔ finite pune ➔ punish

▪ **Y OR CHANGE RULE**

penny ➔ pennies fury ➔ furious stingy ➔ stingiest

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ORTHOGRAPHIC CHANGES WHEN ADDING SUFFIXES

[Examples Below Shared and/or Inspired by Gina Cooke]

1. A grapheme cannot straddle a morpheme boundary.
2. There are constraints on which consecutive vowels English will allow across morpheme boundaries.

- ❑ <y> and <i> do the same job.
- ❑ The <e> in the grapheme <ie> at the end of free base elements (e.g., *tie*, *die*) is needed to provide the required three letters to “lexicalize” these words.
- ❑ The grapheme <ie> is unnecessary when building something other than a free base element: <tie>
<tie> → <ty> + <ing> → <tying>
<tie> + <ed> → <tied>

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The meaning of the word is the sum of its parts.
How many words can you think of that share these Latin base elements?

mobe-mote-move
pense-pend
grade
text
crede
duce-duct
fer
mit-miss
sponse-spond

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Two Types of Suffixes: Inflectional and Derivational

Inflections and derivational morphemes are two kinds of morpheme units that operate differently in word formation.

- INFLECTIONAL SUFFIXES do not change the part of speech of the word to which they are added. The word continues to be a noun, verb, or adjective even with the inflection.
- DERIVATIONAL SUFFIXES usually, but not always, change the part of speech of the word to which they are added.

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Inflections

NOUNS:

- Possession hers
- Gender alumna
- Number toys, wishes, crises

VERBS:

- Tense talked
- Voice He *was* driven.
- Mood She *could have been* driving.

ADJECTIVES:

- Comparison wilder, wildest

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Derivational Complexity

Several types of phonological changes can occur between a base or stem and a derivational suffix:

- syllable regrouping differ ➔ different
- vowel sound change sane ➔ sanity
- consonant sound change electric ➔ electricity
- stress alternation philosophy ➔ philosophical

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How We Remember Words

- ◆ Related words are activated in memory when they have meaningful connections and when they share structural elements at the morpheme level, especially when spelling reveals those connections (Nagy et al, 1989)—even when pronunciation does not:

<late> = to carry; to bear

relate ➔ relative ➔ relation ➔ relationship ➔ interrelate

- ◆ Awareness of morphemes aids understanding and recall of differences among homophones:

site ➔ situation cite ➔ citation
accept ➔ except

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Vowel Sound // Changes

- Long vowel // reduced to schwa (or schwi) //:
*define➔definition compete➔competition
- Long vowel // becomes accented short vowel //:
extreme➔extremity *precise➔precision
profane➔profanity
- Schwa (or schwi) // becomes accented short vowel //:
industry➔indistrious solid➔solidify
*credence➔credential electric➔electrician
- Schwa (or schwi) // becomes accented long vowel //:
injure➔injurious* labor➔laborious*
specific➔species separate➔separation

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Consonant Sound // Changes

Consonant phonemes change in pronunciation from one form of a word to another:

- bomb ➔ bombard ➔ bombardier
- crumb ➔ crumble
- malign ➔ malignant
- sign ➔ signature ➔ signify ➔ signal
- anxious ➔ anxiety
- medic ➔ medicine
- definite ➔ definition
- repress ➔ repression

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Consonant Sound // Changes

Consonant phonemes change in pronunciation from one form of a word to another:

- bomb ➔ bombard ➔ bombardier
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- sign ➔ signature ➔ signify ➔ signal
- anxious ➔ anxiety
- medic ➔ medicine
- definite ➔ definition
- repress ➔ repression

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Morphophonemics

invent	invention
electric	electrician
mathematician	mathematics
rhetoric	rhetorical
definite	finite, define
specific	species/special
solid	solidify
grammar	grammarian
politics	political
inspiration	inspire

victimization

http://www.youtube.com/watch?v=1GU35i1VU2Y&feature=em-share_video_user

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How We Remember Words

- ◎ We know from cognitive experimental research that people with morphological awareness organize their mental dictionaries so that related words are associated and more readily retrieved (Schreuder & Baayen, 1995).
- ◎ ... the mind is always seeking pattern recognition to reduce the load on memory and facilitate retrieval of linguistic information:

auditory ➔ auditorium ➔ audit ➔ audition ➔ audience
inscribe ➔ subscription ➔ scribe ➔ describe ➔ script ➔ ascribable

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Layers of the English Language

borrowed from Marcia K. Henry

GREEK

specialized words
mostly scientific
dependable

some common non-phonetic

phone+o+graph ← combined base elements → neur+o+psych+o+loge+y

LATIN

academic language
content area text
"high class" words
formal settings
mostly phonetic

ANGLO-SAXON

compound words
common, everyday
down-to-earth
ordinary situation
many non-phonetic

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Old English Layer

- **Compounds** are characterized more by their stress pattern than by their spellings. Stress, or accent, almost always occurs on the first word of the compound. Spelling may include a hyphen or a space.

earthquake oatmeal baseball snowman

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Old English Layer

COMPOUNDS

oatmeal	honky-tonk	apple pie
applesauce	day-to-day	green beans
brainwash	two-way	under water
baseball	under-the-table	honor roll
cornbread	twentieth-century	business suit
earthquake	old-fashioned	credit card

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Base Element → <heal>
Melvyn Ramsden—*Real Spelling*

un	heal	s ing ed er
		th y er est ly ness

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Old English Layer

Words of Old English origin are characterized as the common, everyday, down-to-earth words used frequently in ordinary situations.

What is the base element in <happiness>?

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Old English Layer

Words of Old English origin are characterized as the common, everyday, down-to-earth words used frequently in ordinary situations.

What is the base element in >happiness>?

hap [chance]

happy mishap happen happily happiness
happenstance

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Saga of the Scribal-o

Before the printing press, monks who were scribes noticed that many of their quill-penned letters were difficult to read. Most troublesome were the letters formed with *similar, beginning, up-and-down strokes*:

m n w u r v

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Saga of the Scribal-o

- Therefore, the wise scribes changed the vowel grapheme *u* to *o* when *u* appeared adjacent to one of the letters listed.
- The scribes could not, however, alter the pronunciation of the words that were affected by the spelling change they made.
- Therefore, the grapheme *o* in words like, *brother, love, some, and wonder*, is pronounced /u/.
- What about *month* and *Monday*?

Adapted from Carol Murray

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Think of a word that ends in *v*...

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Why don't English words end in *v*?

The letter <u> shares history and behavior with <v> and has a spelling partnership with <o>. The letters <u> and <v> used to be written—and printed—identically—something like <v>. The early printers did develop two versions of the letter—<v> and <u>—but choice between them was determined ONLY by their position in the word, not whether they were functioning as the vowel or the consonant letter.

When vowel <u> or consonant <v> appeared at the beginning of a word, it was written <v> but when either occurred inside a word it was written <v>:

*vnder haue loue
vpon euery ouer vse*

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Spelling /r/ with *wr*...

- Usually one syllable
- Meaning associated with “twisting”

wring	wreath	wrestle	wrangle	write
wrath	wrinkle	wrong	wrench	wrist

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Words that begin with *tw*...

- Meaning associated with “two”

twins	twine	twinkle
tweezers	twelve	twenty
betwixt		between

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Why does <ey> spell /ā/ in <they>?

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Why is there an <l> in <would>?

Why is there an <l> in <should>?

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Is the spelling of <does> unpredictable?

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Romance (Latin) Layer

Romance Layer

Words of Romance origin, like Anglo-Saxon based words, become affixed. In other words, they often have prefixes and suffixes. Usually, however, the base element does not stand alone; affixes **NEVER** stand alone.

reject
transmitting

interrupted
prevention

[Nist, J. (1966). *A Structural History of English*. NY: St. Martins Press]

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Latin Layer

Derivational ➔ Word-Building

- ❑ Words derived from Latin roots/base elements are most common in content area textbooks.
- ❑ Analysis of the number of distinct words in printed school English showed that students encountered over 88,000 “distinct” words in texts through ninth grade (Nagy and Anderson, 1984).
- ❑ About half the words in printed texts through ninth grade occur once in a billion words of text or less (e.g., *inflate*, *extinguish*, *nettle*).

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Latin Layer

Morphological Awareness ➔ Semantic Transparency

- For every word a student learns, there are usually between one and three related words that should be understandable.
- There are degrees of semantic transparency in words
 - Apparent: *red* ➔ *redness*
 - Less Apparent: *apply* ➔ *appliance*
- The less morphological awareness a student has, the more distinct words need to be learned.
- Semantically transparent words are skewed toward the low end of the frequency distribution to a greater degree than morphologically basic words or semantically opaque words (Nagy and Anderson 1984).
- About 60% of the unfamiliar words encountered in the middle school years and beyond are sufficiently transparent—even though they are morphologically complex in structure and meaning—that a reader might be able to infer the meaning of the word (Nagy et al., 1989).

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Romance Layer

How many words can you think of that share the Latin base element <nate>?

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Romance Layer

How many words can you think of that share these Latin base elements:

<secute-seque> [to follow] ?

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Romance Layer

How many words can you think of that share these Latin base elements:

<pel-pulse> [to push] ?

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Romance Layer

How many words can you think of that share these Latin base elements:

<mit-miss> [to send] ?

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Where Do You Stand on These Questions?

1. What is the base element in <instant>?
2. Is <stand> a free base?
3. Do <circumstances> and <stationary> have the same base element?
4. Do <establish> and <statistical> have the same base element?

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What are the elements of the word <antidisestablishmentarianism>?

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onion

http://www.youtube.com/watch?feature=player_embedded&v=0mbuwZK0lr8

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Greek Layer

- ✧ Scientific and mathematical terms incorporated into English in the past 500 years have most often been constructed from Greek morphemes.
- ✧ Many Greek-derived morphemes combine with other bound morphemes of equal importance in flexible order:

geography	photosynthesis
psychology	philanthropic
chronic	synonym

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Greek or Anglo-Saxon?

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Growth in Phonological, Orthographic and Morphological Awareness in Grades 1 to 6
-Berninger, Abbott, Nagy & Carlisle, 2010-

- ❑ Three kinds of morphological awareness show greatest growth in the first three or four grades.
- ❑ One kind of morphological awareness—derivation—continues to show substantial growth after fourth grade.
- ❑ Studies have shown that morphological awareness makes contributions to academic achievement in several areas:
 - ❑ Word Identification—Decoding
 - ❑ Reading Comprehension
 - ❑ **BOTH** Word Identification—Decoding and Comprehension
 - ❑ Written Expression, especially Spelling (Berninger et al. 2008)

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Effects of Morphological Awareness

- ❑ On both oral and written language tasks, good verbal learners have been shown to be more sensitive to derivational relationships and to use this knowledge more productively than have poor verbal learners (Rubin, 1988; Shankweiler, Lundquist, Dreyer, & Dickinson, 1996; Stolz & Feldman, 1995).
- ❑ Linguistically superior fifth graders do better than typical eighth graders with identification and generation of derivational morphemes (Freyd & Barron, 1982).

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Effects of Morphological Awareness

- Better readers with excellent language abilities in fourth through eighth grade are able to talk about word structure and word meaning in a precise, decontextualized manner that reveals conscious knowledge of phonology and morphology (Snow, 1990).
- Adults who read poorly have less information in their mental dictionaries as well as less ability to organize and gain access to words using morphological relationships (Cunningham & Stanovich, 1997; Leong, 1989; Shankweiler et al., 1996).
- Adults who read accurately and fluently have accumulated wide networks of word families for ready access and cross-referencing in the lexicon (Nagy et al., 1989).

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WORDS WITH SPELLING CONNECTIONS HAVE MEANING CONNECTIONS

PHONOLOGY + PHONICS + MORPHOLOGY + ETYMOLOGY = ORTHOGRAPHY

➔FOUR CONVERGING PATHS EN ROUTE TO AUTOMATIC WORD RECOGNITION AND SPELLING◀

Nancy Cushen White, Ed.D.

Effects of Morphological Awareness

- Phonological awareness facilitates morphological awareness in younger children (Carlisle & Nomanbhoy, 1993), and both are associated with stronger reading skills.
- Problems that poor readers have with applying morphological rules to unfamiliar base words are attributable in large part to more basic weaknesses in phonological processing (Carlisle, 1987, 1988; Fowler & Liberman, 1995).
- *Because morphemes are units of both sound and meaning, deficits in phonological processing contribute to confusion of similar-sounding words and word parts, failure to recognize similarities of structure, and failure to either store or retrieve word form with precision.

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Effects of Morphological Awareness

Differences between good and poor spellers are associated with significant differences in sensitivity to word structure at the morphological level. Children with specific written language and spelling disorders have been shown to misuse, substitute, or omit inflected endings more than typical children (Bailet, 1990; Moats, 1996). Insensitivity to morphological aspects of word structure also characterizes adults who spell poorly.

(Fischer, Shankweiler, & Liberman, 1985; Liberman, Rubin, Duques, & Carlisle, 1985; Shankweiler et al., 1996)

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Effects of Morphological Awareness

Well-designed spelling and vocabulary programs make use of morphological structures in word study, making explicit the kind of understanding that good spellers tend to get on their own from seeing words in print. Good spellers and people with larger vocabularies search for and notice in new words letter sequences that can give them clues to meaning (Moats).

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Why are these words spelled this way?

commitment
committee
referral
reference
illegal
accommodate
efficacious
effective

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Layers of English Language Categorize these words.

Old English	Latin	Greek
table	syllable	anthropology
extract	constellation	character
symmetry	healthy	perspiration
brown	pterodactyl	mystery
insect	utility	brother
interrupt	house	illicit
chaos	complement	phantom
survival	eloquent	been

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