

# WORDS WITH SPELLING CONNECTIONS HAVE MEANING CONNECTIONS

PHONOLOGY + PHONICS + MORPHOLOGY + ETYMOLOGY = ORTHOGRAPHY

Nancy Cushen White, Ed.D.

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→ Four Converging Paths En Route  
to Automatic Word Recognition and Spelling←

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Old Grouch  
[www.realspelling.com](http://www.realspelling.com)

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

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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.”

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Pete Bowers

[www.wordworkskingston.com](http://www.wordworkskingston.com)

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

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## Understanding by Design (UbD) & Spelling Instruction???

“Understanding is not mere knowledge of facts but inference about why and how, with specific evidence and logic—insightful connections and illustrations.”

*Understanding by Design*—Wiggins & McTighe, 2005, p. 86

### Guiding Principles of Understanding by Design

- ❑ first step in preparing a lesson or unit is not to plan what the *teacher will do*, but instead to plan what *children should learn*.
- ❑ Backwards design requires the following decisions:
  - What are the enduring understandings (EU's) students should gain from a proposed area of study?
  - What evidence would demonstrate students have achieved the desired result?
- ❑ Set learning goals and an assessment planned to produce evidence of achieved goals that informs the planning of effective lessons.

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Orthography = Etymology + Morphology + 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.
- ❖ Students who understand language structure notice and use these links in meaning.

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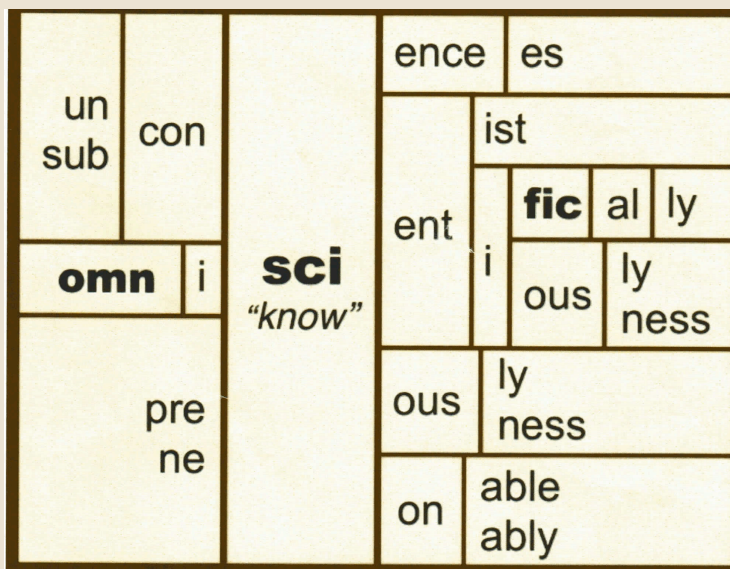
**Morpheme** → smallest meaningful unit of language

Count the morphemes in these words:

- \*elephant → elephants = elephant + s
- \*election → e + lect + ion
- \*accommodation → ac + com + mode + ate + ion
- \*interrelationship → inter + re + late + ion + ship
- photograph → telegraph      graphic
- idiosyncratic = idio + syn + crat + ic
- beneficial → bene + fice + i + al
- conscious = conscience      conscientious      science

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



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## Morphology

Morpheme—smallest unit of meaning

- ◆ Linguistic entity that may be a whole word, part of a word, or a single phoneme

*accept	except
elicit	illicit
affect	effect
*fiscal	physical
specific	pacific
conscious	conscience
*dentist	swiftest
*hostess	famous
*spectroheliograph	

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## Roots-Base Elements-Stems

- Roots → Etymological or Morphological?
  - Strictly historical term (diachronic)
  - Currently used as exclusively etymological
  - Etymological source of the base element

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## 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

- The root of <exhilarate> is the Latin <hilarus> which means “to cheer OR to gladden.”
- The roots of <triskaidekaphobia> are the Greek <treiskai> + <deka> which mean “thirteen” and <phobia> which means “fear of.”

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## Roots-Base Elements-Stems

### EXAMPLES OF ROOTS—Eponyms

- The roots of <Panglossian> are the Greek <pan> which means “all” and <glossa> which means “tongue.”

*Dr. Pangloss was the pedantic old tutor in Voltaire's satirical novel Candide. Pangloss was an incurable, albeit misguided, optimist who claimed that "all is for the best in this best of all possible worlds." So persistent was he in his optimism that he kept it even after witnessing and experiencing great cruelty and suffering. The name "Pangloss" suggests glibness and talkativeness.*

- Eponym → a word derived from the name of a person

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## Roots-Base Elements-Stems

### EXAMPLES OF ROOTS—Eponyms

- Eponym → a word derived from the name of a person
  - sandwich—The Earl of Sandwich was a compulsive gambler—who did not want to stop gambling when he was hungry.
  - bloomers—Amelia Bloomer was the editor of a 19<sup>th</sup>-century ladies' magazine who fought for women's rights. Long hoopskirts, fashionable at the time, were difficult to wear and picked up dirt. AB began wearing a two-piece sports outfit—baggy trousers gathered at her ankles worn under a short skirt. Voila! Bloomers were born!

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## Roots-Base Elements-Stems

### EXAMPLES OF ROOTS—Eponyms

- **Eponym** → a word derived from the name of a person
  - **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 the covers of early books of maps showed Atlas holding up the globe; hence, today a book of maps is called an atlas.*
  - **diesel**—*Rudolf Diesel was a German mechanical engineer who invented the heavy-duty internal-combustion engine to replace the slower steam engine.*

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## Roots-Base Elements-Stems

### EXAMPLES OF ROOTS—Toponyms

- The root of <fez> is <fez>. This word, meaning cylindrical red headgear with a tassel, is named after the Moroccan city of Fez.
- This word is a toponym.
- **Toponym** → a word derived from the name of a place

Examples of Toponyms:

- hamburger
- cologne
- fez

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## Roots-Base Elements-Stems

### EXAMPLES OF ROOTS—Toponyms

- <laconic>  
using or involving the use of a minimum of words; concise to the point of seeming rude or mysterious
- Laconia was an ancient country in southern Greece, bordering on the Aegean and the Mediterranean Seas. Its capital city was Sparta, and the Spartans were famous for their terseness of speech. "Laconic" comes to us by way of Latin from Greek "Lakonikos," which is derived from "Lakon," meaning "native of Laconia."
- Toponym → a word derived from the name of a place

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## Roots-Base Elements-Stems

### EXAMPLES OF ROOTS—Toponyms

- <la la land>
  1. A place or a state of being out of touch with reality
  2. A place known for frivolous activities.
- *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.*
- This word is a toponym.
- Toponym → a word derived from the name of a place

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## ☐ Roots-Base Elements-Stems

### Base Element

- ☐ Essential kernel 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

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## Roots-Base Elements-Stems

- ◆ “Root” is a strictly historical etymological term.
  - Diachronic—historical development
  - Meaning and form through time between a word and its origin
  - Origin and history of a base

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## Roots-Base Elements-Stems

### Base Elements

- ❑ 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
  - Any or all may appear in the same word family.
- ❑ Different Bases derived from the same 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> spells /ɪ/.

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

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## Bound Morphemes

- Work as meaningful units **ONLY** in combination with other morphemes
- **NEVER** stand alone
- **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> in <father>.
- There is NO <th> in <fathead>: <fat> + <head>.
  
- There is a vowel digraph <ea> in <heal>.
- There is NO <ea> 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.

- <agreee> + <ed> → <agreed> [NOT agreeed]
- <agreee> + <ing> → <agreeing>
- <eight> + th → <eighth> [NOT eightth]
- <fulll> + ly → <fullly> [NOT fulllly]

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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*, *dje*) 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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## ORTHOGRAPHIC CHANGES WHEN ADDING SUFFIXES

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

### ▪ Y OR CHANGE RULE

<cry> + <ed> = <cried>

<try> + <ing> = <trying>

Are these exceptions to the rule? Why?

- pay—paid      say—said      lay—laid
- day—daily      slay—slain

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## Hints for Placement of Stress [Accent]

1. \_\_\_ / \_\_\_      spider, scramble, olive, crisis
2. \_\_\_ base'      provide, invert  
   \_\_\_ base' \_\_\_      repellent, committee, referral
3. \_\_\_ / \_\_\_      cucumber, government, reference  
   \_\_\_ / \_\_\_      ridiculous, provisional, reciprocal
4. \_\_\_ / /sh/ \_\_\_      education, delicious, proficient, special
5. \_\_\_ / ity      responsibility, tenacity, personality  
   \_\_\_ / ic\*      cosmic, authentic, algebraic, rhetorical\*  
   \_\_\_ / ion      champion, religion, onion  
   \_\_\_ / ian      Italian, reptilian, physician, crocodilian  
   \_\_\_ / ial      familial, radial  
   \_\_\_ / ious      curious, melodious, fastidious, spacious

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NCW 2000

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## The Elusive SCHWA (ə)

- 1895 from German *schwa*
- Ultimately from Hebrew *shewa*
- "A neutral vowel quality"
- Literally means "emptiness"

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## Morphophonemics

invent <u>i</u>	invention <u>i</u>
electric <u>i</u>	electrician <u>i</u>
mathem <u>a</u> tician	mathem <u>a</u> tics
rhet <u>o</u> ric	rhet <u>o</u> rical
def <u>i</u> nite	f <u>i</u> nite/def <u>i</u> nite
spec <u>i</u> fic	spec <u>i</u> es/spec <u>i</u> al
sol <u>i</u> d	sol <u>i</u> dify
gram <u>a</u> rr	gram <u>a</u> rrian
pol <u>i</u> tics	pol <u>i</u> tical
insp <u>i</u> ration	insp <u>i</u> re

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## Good readers attend to word parts.

- Good readers attend to the parts of words, both spoken and written.
- They use strategies to distinguish and remember the meanings of words that sound alike, including recognition of meaningful parts.

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## 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.

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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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English orthography → → meaningful parts

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

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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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## Two Types of Suffixes: Inflectional and Derivational

Inflectional suffixes and derivational suffixes 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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## Derivational Complexity

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

- syllable regrouping      differer ➔ 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):

<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 → extreme      \*precise → precision  
profane → profanity      brutal → brutality
- ❑ Schwa (or schwi) // becomes accented short vowel //:  
industry → industrious      solid → solidify  
\*credence → credencial      electric → electrician
- ❑ Schwa (or schwi) // becomes accented long vowel //:  
injure → injurious      labor → laborious  
specific → species      separate → separation

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## Consonant Sound // Changes

Consonants change in pronunciation from one form of a word to another, even though most of the root (base) words stay the same in spelling:

- ❑ bombb → bombbard → bombbardier
- ❑ crumbb → crumbble
- ❑ malignn → malignnant
- ❑ signn → signnature → signnify → signnal
- ❑ anxnious → anxnxiety
- ❑ medicc → mediccine
- ❑ definitte → definittion
- ❑ represss → represssion

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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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## Anglo-Saxon 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

<u>COMPOUNDS</u>		
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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## 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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# WORDS WITH SPELLING CONNECTIONS HAVE MEANING CONNECTIONS

PHONOLOGY + PHONICS + MORPHOLOGY + ETYMOLOGY = ORTHOGRAPHY

Nancy Cushen White, Ed.D.

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

- have
- love
- give
- live
- relative
- authoritative

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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 <u>:

*vnder    haue    loue*  
*vpon    euery    ouer    vse*

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# WORDS WITH SPELLING CONNECTIONS HAVE MEANING CONNECTIONS

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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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# WORDS WITH SPELLING CONNECTIONS HAVE MEANING CONNECTIONS

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Why <ey> in <they>?

they

them

their *[y changed to i inside a word]*

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

will → would

shall → should

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# WORDS WITH SPELLING CONNECTIONS HAVE MEANING CONNECTIONS

PHONOLOGY + PHONICS + MORPHOLOGY + ETYMOLOGY = ORTHOGRAPHY

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Is the spelling of <does> unpredictable?

do

does

doing

go

goes

going

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Do you doubt the logic of the reason for the <b> in <doubt>?

<http://ed.ted.com/lessons/beyond-the-shadow-of-a-doubt-gina-cooke>

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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., *inflated, 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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# WORDS WITH SPELLING CONNECTIONS HAVE MEANING CONNECTIONS

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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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**WORDS WITH SPELLING CONNECTIONS HAVE MEANING CONNECTIONS**

**PHONOLOGY + PHONICS + MORPHOLOGY + ETYMOLOGY = ORTHOGRAPHY**

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What are the elements in the word  
<antidisestablishmentarianism>?

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onion

[http://www.youtube.com/watch?  
feature=player\\_embedded&v=0mbuwZK0lr8](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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## 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 (e.g., 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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## 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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# WORDS WITH SPELLING CONNECTIONS HAVE MEANING CONNECTIONS

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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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