



## What is crazy -- the English spelling system, or our typical systems for teaching spelling?

Consider the frustration experienced by the student in this story. The teacher does the best his training allows as he tries to help his student deal with yet another "irregular" spelling. Imagine the consequences for learning when such experiences are repeated over and over.

### "Know More Explosions"

#### Excerpt from a Grade 4 teacher's email

My program is for junior students identified with behaviour problems, problems which make their full-time participation in "standard" classrooms problematic for everyone involved. Most of our students have ADHD identifications, often coincident with LDs and other difficulties, and virtually all of them read more than two grade levels lower than they should. In many instances, the students' behaviour difficulties and their language deficits pose a chicken-and-egg question.

In a guided reading session I was doing with a burly and eager Grade 4 student reading at PM 9, the student pointed to the work "know" and asked what it said. Knowing my students, I prepared him for my answer with "OK, this is going to blow your mind, but . . . ." When I finished with "It says /no/," he didn't miss a beat. He tore the book off the table and flung it across the room. And then he started: "It does not f\*#!ing say 'no!' " - giving the whole class a language lesson as he tore a path toward the classroom door - "<k> says /k/ and <w> says /w/, so it does not say f\*#!ing 'no' !" How am I supposed to learn this sh\*!t when the rules change? <K> f\*#!ing says /k/!"

After the student de-escalated - and being told that <knight> says /night/ DIDN'T help, I promised him I'd find out why that word is pronounced as it is.

Robb

Cursing our crazy spelling system seems like a natural response to Robb's story about the struggle to learn and teach reading and spelling in English. It would be so much easier if we just had a reliable, logical spelling system!

Ironically, it turns out that our spelling system *does* meet these exact criteria. Unfortunately this assertion seems absurd in light of the instruction most of us have received.

It is important to recognize, however, that the common assumption of English spelling as an unreliable, exception-riddled system is a hypothesis that can be tested.

**The science of spelling:** Scientific inquiry of the conventions of English spelling provides plenty of evidence that our spelling system is an extremely reliable and ordered system for representing the meaning of words to English speakers. (e.g. [Carol Chomsky, 1970](#)).

There is obviously much more to spelling than morphology. However, scientific analysis of English spelling makes it clear that we cannot make sense of our spelling system *without* morphological understanding.

Orthographic morphology is the conventional system by which spoken morphemes are written. Instruction can direct the attention of learners to this concrete representation of the meaning structure of words. Students can use morphological knowledge gained through instruction to define words they were not taught, but which are morphologically related to words that they were taught. (Bowers & Kirby, 2010). However, teaching morphology is not only about showing learners how bases and affixes can be used to learn new vocabulary.

Click [here](#) for lessons investigating the spelling of <know> inspired by Robb's story.

Research has long emphasized the importance of letter-sound knowledge for literacy development (e.g., Rayner et al., 2001). The interrelated nature of morphology and phonology in English means that we cannot fully understand letter-sound correspondences without understanding the role of morphology.

It makes sense that learning letter-sound correspondences would be facilitated by a fuller *understanding* of how they operate. As linguist Richard Venezky pointed out long ago, "the simple fact is that the present orthography system is not merely a letter-to-sound system riddled with imperfections, but, instead, a more complex and more regular relationship wherein phoneme and morpheme share leading roles" (Venezky, 1967, p. 77).

**A spelling test of spelling instruction**

All of the words below have spellings that conform perfectly with the conventions of English spelling that linguists Richard Venezky, Carol Chomsky and others outlined long ago.

How many of these spellings can most teachers *explain* to children?

- |         |                   |                   |
|---------|-------------------|-------------------|
| cries   | give              | business          |
| sky     | package           | brother, hothouse |
| really  | knew, new, know   | putting           |
| ball    | night             | stopper, proper   |
| helpful | laughed, painted, | prints            |
| full    | used, sled,       | bankruptcy        |
| receive | been, teen        | skiing            |
| house   | does              | question          |

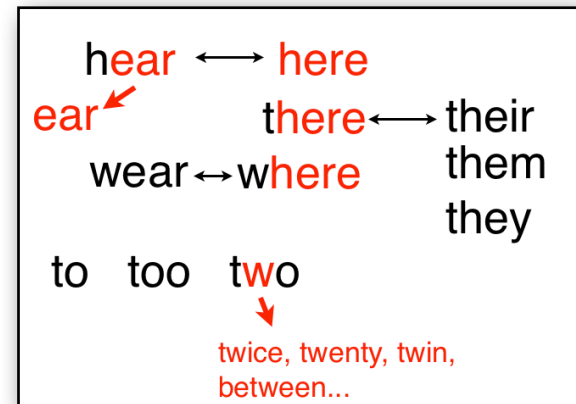
Teachers need to know about more than morphology to explain these spellings, but establishing the morphological structure of a word is a necessary part of that process, even for base words.

For just one example of how morphology makes sense of letter-sound correspondences, see the explanation of the spelling of <does> and related words that follows.

Function Words	Content Words
<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     or to be                 </div>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     ore oar too two bee                 </div>
<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     he she on in                 </div>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     homophones If one of a set of homophones is a function word, it will use fewer letters than its homophone(s).                 </div>

- Only function words use one or two letters (they can use more).
- Content words use at least three letters.

Find a tutorial film on function and content words and additional resources on this topic [here](#).



Learn more about etymology and how it helps understand the spellings of the words from the slide above from the Real Spelling Tutorial films at this [link](#).

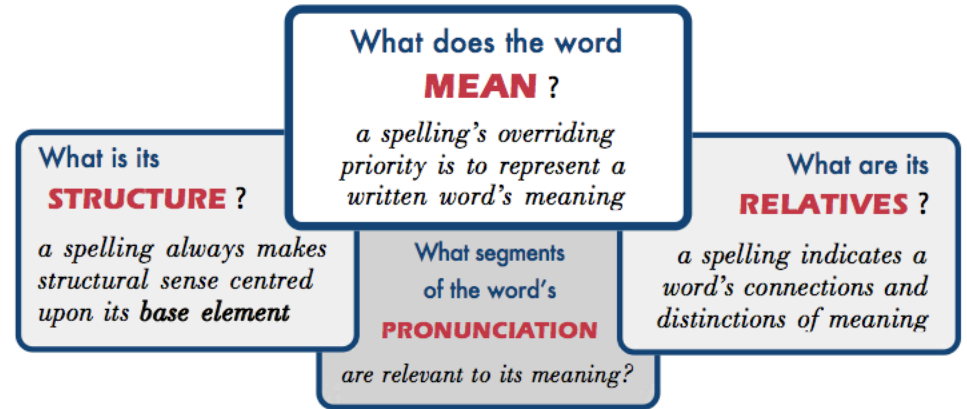
See the Real Spelling Tutorial film on "The Homophone Principle" at this [link](#).

# Guides for Structured Word Inquiry

## “Big Ideas” to guide Structured Word Inquiry

Once teachers develop a basic understanding of English spelling and they begin to take on the structured inquiry approach (Bowers & Kirby, 2010), they should be able to identify how any instruction of the written word reinforces one, two or or all of the following “big ideas.”

1. English spelling is a highly ordered system for representing meaning that can be investigated and understood through scientific inquiry.
2. Scientific inquiry seeks the most elegant solution -- the deepest structure that accounts for the greatest number of cases. (See this [example](#))
3. Analysis of word structure for meaning cues can be used to deepen understanding of concepts and terms in any subject area (Science [example](#), Humanities [example](#) & [video](#)).



Above figure from [www.realspelling.com](http://www.realspelling.com)

## Process of “Structured Word Inquiry”

- 1) Catch learners with an interesting spelling question. (e.g., why <g> in <sign>?)
- 2) Strategically present a set of words that makes the relevant pattern more salient.
- 3) Help learners hypothesize a solution from carefully presented evidence.
- 4) Guide testing of learners’ hypotheses and identify the precise pattern.
- 5) Practice the identified pattern with appropriate tools (e.g., word sums, flow charts).

See more on structured word inquiry, and the difference between “teacher-led inquiry” and “inquiry-led teaching” at this [link](#).

## Stuck on a Spelling?

Investigate with these questions...

- (1) What does the word mean?
- (2) How is it built?  
(Can you identify any affixes with a word sum?)
- (3) What other related words can you think of?  
(Can the [Word Searcher](#) help you make a matrix?)
- (4) What are the sounds that matter?  
(What grapheme/phoneme correspondences can you find that fit in your hypothesized morphemes?)

morphological connections?

etymological connections?

### Is <does> really an irregular spelling?

Typically instruction leads children to believe that <does> is one of many irregular spellings they have to memorize. In contrast, the word <goes> is treated as regular.

See how the matrix and word sums below make sense of these spellings by providing a concrete representation of the interrelation of structure and meaning of the <do> and <go> word families.

**A morphological matrix for <do> and <go>**

do	ing
go	es
	ne

**Word Sums for <do> and <go>**

do + ing → doing	go + ing → going
do + es → does	go + es → goes
do + ne → done	go + ne → gone

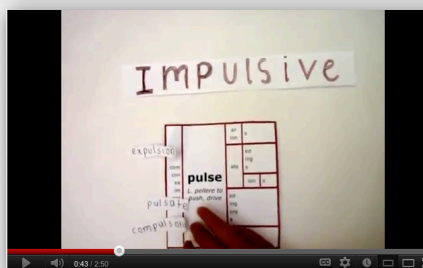
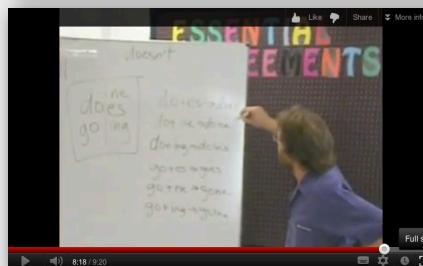
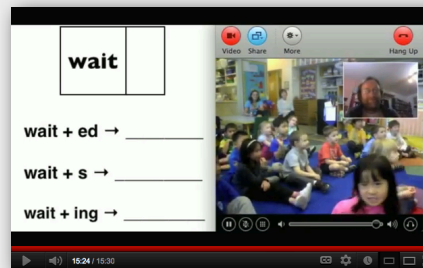
With these linguistic tools, children can be introduced to <does> as an ingenious spelling because it marks its meaning connection to its base <do> with a consistent spelling. The spelling structure of these word families is a brilliant opportunity to show children why it is useful that most letters (graphemes) can represent more than one pronunciation. Only in this way could the spelling of <do> and <does> use the same spelling of the base!

Instead of adding it to a list of irregular words, teachers who understand morphology can use the spelling of a word like <does> to introduce children to the ordered way their spelling system works.

*“Teachers who consider English a chaotic and unprincipled writing system likely foster a similar view among their students. Such pupils may not look for patterns in the system because they believe that few exist to be discovered. Teachers who appreciate the writing system can help students find its patterns, fostering a positive attitude about spelling”*

Treiman and Kessler (2005, p. 133)

### Screen shots from classroom videos



### Links to classroom videos

Click [here](#) for a lesson introducing kindergarten students to the word sum and the matrix.

Click [here](#) for a lesson investigating the spelling system through word sums and matrixes for <do> and <go>.

Click [here](#) for a Grade 7 presentation of learning about Greek mythology via morphological and etymological analysis.

Click [here](#) for a Grade 7 student explaining his understanding of the political world through morphological and etymological analysis of the word <dissent>.

Explore a large bank of videos of structured word inquiry in classrooms at this [YouTube page](#).

**The word matrix**  
([www.realspelling.com](http://www.realspelling.com))

un in re con	<b>quest</b> <i>Latin Root</i> <i>quaerere</i> <i>'ask, seek, gain'</i>	s ing ed	
		ion	s able ing

The **word matrix** marks the only feature of an orthographic morphological family that is stable - the underlying orthographic representation of its morphemes. These representations correspond to what [Carol Chomsky \(1970\)](#) called "lexical spellings."

The pronunciation and connotation of a morpheme can vary across members of a family. The lexical spelling of a morpheme -- that is captured by word sums and matrices -- remains stable.

**The morphological matrix is a map of the interrelation of structure and meaning of written word families**

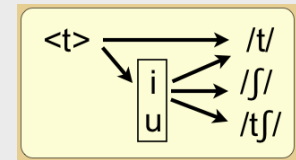
The word matrix represents members of an orthographic morphological word family. Such word families share a connection in *both structure and meaning*. (See tutorial film & resource from Real Spelling [here](#).)

- *structure*: common underlying spelling of the base
- *meaning*: common ultimate etymological origin of the base

Inclusion of a word in a matrix is tested with a word sum. The word sum isolates the constituent morphemes (bases and affixes) on one side of the rewrite arrow (marking all morphological [suffixing conventions](#)) and on the other, the realized surface structure of the word.

An "echo" of the denotation of the root meaning of the base of any word represented by a matrix can be detected in the connotation of that realized word. The denotation of the root meaning of a word is checked with an etymological reference (e.g. [etymonline.com](http://etymonline.com)).

**Interrelation of graphemes and morphemes**



Graphemes comprised of single letters or 2- or 3-letter teams that represent a phoneme. They occur within morphemes.

Possible phonological representations of a grapheme are signaled by circumstances.

The diagram above shows three of the possible phonological representations of the <t> grapheme. Two of these are realized in the words of the <quest> matrix shown on this page.

Note that since the <o> and the <e> graphemes in <does> are not in the same morpheme, there is no <oe> digraph in this word.

**base spelled**

**base pronounced**

**Word Sums (examples listed by pronunciation of base)**

<quest>

/kwɛstʃ/

quest + ion → question

quest + ion + able → questionable

/kwɛst/

in + quest → inquest

con + quest → conquest

re + quest + ed → requested

**matrix**

**base spelled**

**base pronounced**

**Word Sums (examples listed by pronunciation of base)**

<b>do</b>	ing es ne
-----------	-----------------

<do>

/du:/

do + ing → doing

/dʌ/

do + es → does

do + ne → done

A Series of "Teacher-Led Inquiry" lessons sparked from the question "Why is there a <g> in <sign>?"

WordWorks Lessons® by Peter Bowers, 2007, [www.wordworkskingston.com](http://www.wordworkskingston.com) Based on (Ramsden 2001) [www.realspelling.com](http://www.realspelling.com)

Name \_\_\_\_\_

**Activity Sheet #1**

**Word Building: Using a Real Spelling Word Matrix**

A WORD MATRIX USUALLY ONLY SHOWS *SOME* POSSIBLE WORDS, YOU CAN USUALLY FIND MORE IF YOU TRY!

**Rules for reading a word matrix:**

- Read a matrix from left to right
- Make only single, complete words from a matrix
- If you are unsure that a word you build is a real word, check a dictionary
- You don't have to take an element from every column of a matrix – BUT
- You must not 'leapfrog' over a column
- WATCH THE JOINS – sometimes changes happen where you add a suffix

	re		al	
	as	<b>sign</b>	ing	
			ed	ment
re	de		ify	
			ate	ure

Build words with your cut out **prefixes** and **suffixes** on the **base <sign>**. Once you have built a word, write the **word sum** as modeled in 1 and 2.

**Part A:**

\_\_\_\_\_ prefix(es)- **base** - suffix(es)

- 1) sign + al → signal
- 2) as + sign + ment → assignment
- 3) \_\_\_\_\_ → \_\_\_\_\_
- 4) \_\_\_\_\_ → \_\_\_\_\_
- 5) \_\_\_\_\_ → \_\_\_\_\_
- 6) \_\_\_\_\_ → \_\_\_\_\_
- 7) \_\_\_\_\_ → \_\_\_\_\_
- 8) \_\_\_\_\_ → \_\_\_\_\_
- 9) \_\_\_\_\_ → \_\_\_\_\_
- 10) \_\_\_\_\_ → \_\_\_\_\_

Real Spelling Tool Box Connection  
3E - The base elements <sci> and <sign>

Name \_\_\_\_\_

**Part B:** Word sums from <pack> matrix

re	un	<b>pack</b>	s	
			er	
			ing	
			ed	
			age	es
				ing
			et	ed
				s

- 1) \_\_\_\_\_ → \_\_\_\_\_
- 2) \_\_\_\_\_ → \_\_\_\_\_
- 3) \_\_\_\_\_ → \_\_\_\_\_
- 4) \_\_\_\_\_ → \_\_\_\_\_
- 5) \_\_\_\_\_ → \_\_\_\_\_
- 6) \_\_\_\_\_ → \_\_\_\_\_
- 7) \_\_\_\_\_ → \_\_\_\_\_
- 8) \_\_\_\_\_ → \_\_\_\_\_
- 9) \_\_\_\_\_ → \_\_\_\_\_
- 10) \_\_\_\_\_ → \_\_\_\_\_

Real Spelling Tool Box™ Connection  
1B - Making plurals -1- whether to use <-es> or <-s>

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## Lesson #2: Spelling Detectives

When does Suffixing Cause Changes at the Joins?

### A) Investigation: Developing a hypothesis

Study the matrix for <move> and the word sums created from it to see if you can discover a consistent suffixing pattern.

#### Word Sums from <move> Matrix

(Draw a line through silent <e>s replaced during suffixing as shown in the second sum.)

re un	move	s
		ing
		ed
		er ment

move + s → moves  
 mov~~e~~ + ing → moving  
 move + ed → moved  
 move + er → mover  
 move + ment → movement  
 re + move + ed → removed  
 re + move + er → remover  
 un + move + ed → unmoved

1. What is the change that sometimes occurs at the suffix join?
2. List the suffixes that cause the change: \_\_\_\_\_
3. List the suffixes that cause no change: \_\_\_\_\_
4. How are these suffixes different from each other?
5. Our class' hypothesis to explain how you know which suffixes *may* force a change at the join:

#### Real Spelling Tool Box Connections

1K - Learning from Love (Learn about the letter <v>)  
3A - Revisiting Suffixing (Learn many roles of the single, silent <e>)

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## Lesson #2 Continued...

### B) Testing our Hypothesis:

These matrices build on *base words* (a one *morpheme* word - no *prefix* or *suffix*) that end with the letter 'e'.

- Create word sums from a variety of the matrices to test our class hypothesis. (You don't need to build every possible word from each matrix to test the hypothesis.)
- Be ready to share interesting discoveries with the class. Any surprising findings, or words whose pronunciation changes when you add affixes?

dis	please	es ed ant ure
-----	--------	------------------------

un	hope	s ing ed ful less
----	------	-------------------------------

dis	agree	ing ed ment able
-----	-------	---------------------------

re	take	s ing en
		out

mis	be	have	s ing ed
			i OUR (Can) OR (US)

en	large	es er ing ed ly ish
		ment
		s

be	ing en
----	-----------

#### Real Spelling Tool Box Connections

1D - The effect of suffixes on a single, silent <e>  
1B - Making plurals - l- whether to use <-es> or just <-e>  
3G - The end of base words <dge> or just <ge>? the suffix <-age> (understanding the silent <e> in <large>  
1G - 'long' and 'short' vowels and the single, silent <e>  
1I - Homophones -l- (Make sense of the silent <e> in <please>  
1H - Compound words -l- (Does <takeaway> break suffixing conventions?)

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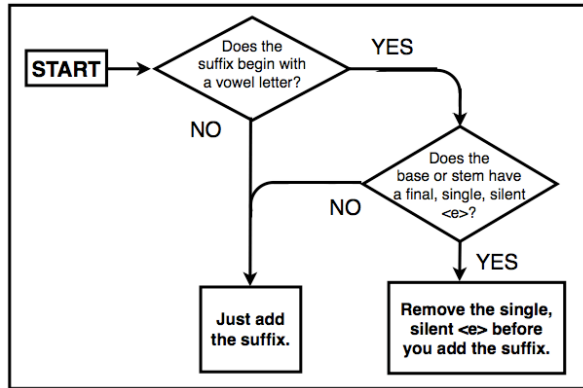
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### Activity #3

#### Flow Chart for Dropping the Single, Silent <e> During Suffixing

**Instructions:**

- On a separate page, rewrite the beginning of the word sum provided.
- Use the flow chart to identify the correct spelling when fixing the suffix to the base.
- When a silent <e> is replaced by a vowel suffix, cross it out on the left or the “rewrite arrow” before competing the spelling on the left side of the arrow.



Example: date + ing → dating

**Word Sums**

- |                     |                     |
|---------------------|---------------------|
| 1. cave + ed →      | 11. laze + y →      |
| 2. create + or →    | 12. rule + er →     |
| 3. require + ment → | 13. imagine + ary → |
| 4. smile + ing →    | 14. pure + ly →     |
| 5. rude + ly →      | 15. please + ure →  |
| 6. brave + est →    | 16. operate + ion → |
| 7. brave + ly →     | 17. smile + s →     |
| 8. include + ing →  | 18. amaze + es →    |
| 9. lone + ly →      | 19. amaze + ment →  |
| 10. close + ness →  | 20. ice + y →       |

Real Spelling Tool Box Connections  
3A - Revisiting suffixing (Is <-y> a vowel suffix?)

### Spelling Word Structure Out Loud & in Writing

**1) Spell words out loud (see examples)**

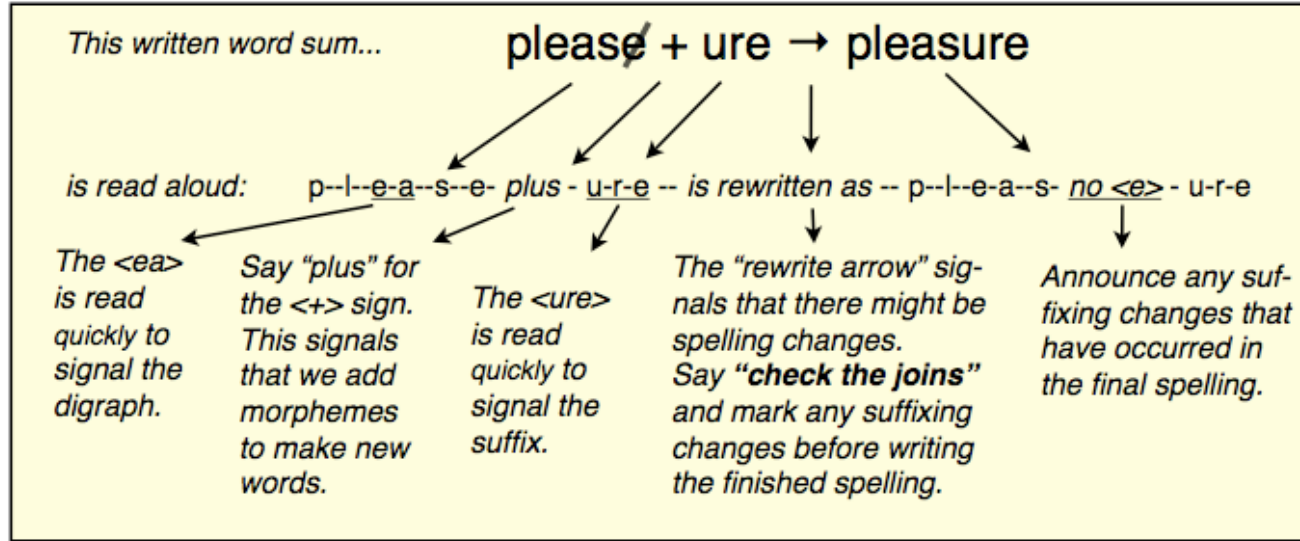
- <digging> say: d-i-double g-pause- i-n-g  
 <spilling> say: s-p-i-double t-pause - i-n-g  
 <helpfully> (no 'double letter!') say: h-e-l-p - pause - f-u-l - pause - l-y

**2) Make reverse word sums (show changes)**

- digging →
- duckling →
- spilling →
- helpfully →
- little →
- littler →
- losing →
- looser →
- because →
- ponytails →
- cries →
- tried →
- trying →
- taking →
- lazy →
- hopped →
- hoped →
- pliers →
- whole →
- holes →
- reused →

## The Word Sum and the Matrix

The word sum is the basic linguistic tool for revealing the structure of any word. We need to learn how to write and spell out loud word sums with our students. Here one example:



Complete these word sums, by writing and spelling them out loud. Make sure to show any changes.

See a video modelling the instruction of word sums at this link:

<http://www.youtube.com/user/WordWorksKingston#p/u/0/qeYgZDstkI>

un + help + ful → \_\_\_\_\_

dis + cover + y + es → \_\_\_\_\_

hope + ing → \_\_\_\_\_

try + ing → \_\_\_\_\_

hop + ing → \_\_\_\_\_

try + es → \_\_\_\_\_

carry + age → \_\_\_\_\_

busy + body → \_\_\_\_\_

**Step #1: Build left side of word sum.**

*This written word sum...*

please + ure →

...is written and spelled aloud in groups like this: p--l--ea--s--e-- "plus" --ure "is rewritten as"

**Step #2: Say "Check the joins!" and mark changes on left side of word sum.**

a) Note that <-ure> is a vowel suffix that replaces the final, single, silent <e> of <-please>.

b) Draw a line through that silent <e> to remind yourself to announce that change when you complete the right side of the word sum.

For suffixing conventions see [Big Suffix Checker](#) and/or [Interactive Suffix Checker](#)

vowel suffix

final, single, silent <e>

please + ure →

**Step #3: Complete right side of word sum, announcing the structure you have represented on left side of word sum.**

Spell and write out the result...

please + ure → pleasure

...in groups like this: p--l--ea--s-- "no <e>" -- "pause" -- ure

**Steps for constructing a word sum that includes marking and announcing double letters**

**Step #1: Build left side of word sum.**

*This written word sum...*

com + mit + ee →

...is written and spelled aloud in groups like this: com-- "plus" --m-i-t-- "plus" -- "double e" -- "is rewritten as"

**Step #2: Say "Check the joins!" and mark changes on left side of word sum.**

a) Note that the <-ee> vowel suffix forces the doubling of the final single <t> (See big suffix checker for conventions.)

b) Mark a doubled <t>.

For suffixing conventions see [Big Suffix Checker](#) and/or [Interactive Suffix Checker](#)

vowel suffix

Mark doubled <t>

com + mit(t) + ee →

**Step #3: Complete right side of word sum by announcing the structure you have represented on left side of word sum.**

Spell and write out the result...

com + mit(t) + ee → committee

...in groups like this:

- If the same letter occurs twice in a row within a morpheme, or if it is doubled because of a suffixing change, it is announced as a "double letter" in a word sum.
- If there is a plus sign between a letter that is repeated twice in a row it is an "accidental juxtaposition" not a double letter. There are two <m>s in <-committee> but there is no "double m". There is a "double t" and a "double e".

**Step #1: Build left side of word sum.**

This written word sum...

ease + y + ly →

ea-s-e-- "plus" --y-- "plus" --ly-- "is rewritten as"

**Step #2: Say "Check the joins!" and mark changes on left side of word sum.**

For suffixing conventions see [Big Suffix Checker](#) and/or [Interactive Suffix Checker](#)

Mark the <y> / <i> change

Mark the dropped <e>

Note that the vowel suffix <y> replaces the single silent <e> of <ease>.

Note that there is no good reason to keep the <y> inside the word when adding the <-ly> suffix.

Mark all the changes.

ease + y + ly →

**Step #3: Complete right side of word sum, announcing the structure you have represented on the left side of the word sum.**

Spell and write out the result...

ease + y + ly → easily

ea-s- "no e" -- "pause" -- "change the y to i" -- "pause" --ly

...in groups like this:

- Videos of teachers and students spelling out word structure with word sums and working with matrices
- A [Skype tutoring session](#) with a Grade 2 student with word sums and the matrix.
- Go to the [WordWorks YouTube](#) page for many videos of students and teachers spelling out word sums and working with matrices.

## The Orthographic Word Sum

The word sum is the basic linguistic tool for revealing the underlying structure of any word. Complete these word sums, by writing and spelling them out loud. Make sure to show any changes. Note that in the "Analytic Word Sums" the user sometimes has to identify if the starter word is a base, or if it is complex. Find more on this practice [here](#), and a video modelling the instruction of word sums at this [link](#).

### Synthetic Word Sums

Substructure	→	Surface Structure
spring	→	spring
care + ful + ly	→	
spell + ing	→	
cute + er	→	
cut + er	→	
act + ive + ity + es	→	
marry + ing	→	
marry + es	→	
sky + dive + ing	→	
carry + age + es	→	
un + heal + th + y + ly	→	
nate + ure + al + ly	→	

### Analytic Word Sums

Surface Structure	→	Substructure
alone	→	
does	→	
disease	→	
spilling	→	
duckling	→	
rightfully	→	
bookkeeper	→	
assistance	→	
sisterhood	→	
disruptive	→	

## From the Matrix to the Word Sum

The starting point of making sense of English spelling, and thus the foundational strategy for structured word inquiry is gaining practice building word sums from matrices.

All of these matrices are taken from the 70 matrices DVD. You can copy and paste any of those matrices to build lessons in minutes.

<b>when</b>	<b>ever</b>	y	<b>thing</b>
<b>how</b>			<b>body</b>
<b>what</b>			<b>one</b>
<b>who</b>			<b>where</b>

un	<b>ease</b>	y	er
dis		es	ty
		ing	ness
		ed	

<b>super</b>	<b>star</b>	s	ing
		ed	y
		less	dom
		let	let
		<b>dust</b>	
		<b>light</b>	
		<b>struck</b>	
		<b>fish</b>	
		<b>gaze</b>	ing

<b>fright</b>	ful	ly
	ness	
	s	ed
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		s

un	<b>do</b>	ing
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		ne
		able
	es	<b>n't</b>
	<b>n't</b>	

mis	<b>use</b>	ful	ly
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		ed	er
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		able	
		er	s
<b>door</b>		age	es
<b>back</b>		<b>gap</b>	
<b>show</b>		<b>over</b>	
		<b>watch</b>	

ne	o	<b>nate</b>	al	ly	
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			ity		

### Rules for reading a word matrix:

- Read a matrix from left to right.
- Make only single, complete words from a matrix.
- Only build words you can use in a sentence.
- You don't have to take an element from every column of a matrix – BUT...
- You must not 'leapfrog' over a column.
- WATCH THE JOINS! Sometimes changes happen where you add a suffix.

### Some Challenges

Write your word sums that come from these matrices on a separate page. Investigate the matrices to build word sums that...

- Produce compound words.
- Show each of the suffixing changes.
- Force a change in the pronunciation of the base.
- That produce complex words that have 'long vowel sounds'.

### Some Questions

- Can you find a base with a digraph that can represent more than one phoneme?
- What base uses a trigraph?
- What base uses a <t> to represent /t/ in one derivation, but /f/ in another derivation (the same phoneme commonly associated with the <sh> digraph).
- What questions challenges could you give your class from these matrices?



## Word Detectives Activity: Finding Word Families

Word families are words related in spelling structure and meaning to a common base.

### 1) Finding a family of words related to <image> with the Word Searcher.

To find the Word Searcher:

- Type the words Neil Ramsden Word Searcher into Google
- Click on the first hit "Word Searcher"
- You're there!

#### Background for Finding the Family: Testing for structure and meaning

The Word Searcher does not know about bases, prefixes and suffixes. If we are looking for words in the same word family as <image>, we first have to analyze this word to see if it is a simple base word (one morpheme word) or a complex word (a base with at least one other morpheme).

One hypothesis is that <image> has the base <image> and the suffix <ine> with this word sum:

*image/ + ine → imagine*

To be confident this hypothesized analysis is correct, we test the word sum to make sure it makes sense in terms of **meaning** and **spelling structure**. (See confirmation of that analysis in box below.)

#### Warning about Word Searcher searchers!

Typing the letters <image> in the "Search Pattern" field will not bring up the word <image> because the Word Searcher just pics words with the same letter sequence. The word <imagine> uses the base word spelled <image>, but it does not have the letter sequence <image>.

To get a list of words that are likely related to the base <image>, we need to type the letter sequence <imag>.

#### Starting the Search...

##### Step 1: Finding potential family members

Type the letters <imag> in the "search pattern" field and press the "go" button.

You should get 20 matches.

##### Step 2: Refining the list to the <image> family

Look for connections of **structure** and **meaning**.

Some of the words in this list might not use the base <image>. Copy and paste the words that you think are built on <image> into a word processing document.

With a partner, try to make word sums that could use the base <image> and which have a connection in meaning to that word.

##### Step 3: Building the <image> matrix

Use the prefixes and suffixes from the word sums that work to build the matrix that is started for you. The suffixes you need to build <imagine> and some other words are already included. See what else you can get in this matrix for the word family of <image>!

#### Testing Meaning and Spelling Structure

**Meaning Test:** The hypothesis of a meaning connection between <image> and <imagine> is reasonable. To "imagine" something is to create an "image" of it in our mind. We can confirm this connection by looking at the origin of both of these words. [Etymonline](#) cites the Latin root *imago* for "copy, statue, picture, idea, appearance". We have evidence to conclude <image> and <imagine> are really related in meaning.

**Spelling Structure Test:** We have already demonstrated that there is a base spelled <image>. To be sure the word sum works, we have to test

*Is <ine> a suffix?* A quick check of a dictionary shows a number of uses of the <ine> suffix. One entry in my Oxford gives this citation: a suffix forming chiefly abstract nouns and diminutives such as *doctrine, medicine, figurine*. A can see the structure <medic + ine> and <figure/ + ine>. I'm curious about <doctr + ine> but can leave that for the moment.

*Does <ine> replace final, single, silent <e>s?* Yes! We need to learn how vowel and consonant suffixes operate so that we can do this kind of analysis. Note that this worked for *figure/ + ine → figurine* also. See Real Spelling Theme ID "The effect of suffixes on the single, silent <e>" or the lessons in WordWorks' "Teaching How the Written Word Works" for ideas for teaching and learning about this suffixing pattern.

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

## Finish the Word Matrix!

image	ine	ably	
	ate		

After you've identified which of the 20 words below do use the base <image>, build word sums to find affixes needed to build the <image> matrix.

#### Search Results for "imag" (20 matches)

image	imagined
imagery	imagines
images	imaging
imaginable	imagining
imaginary	imaginings
imagination	pilgrimage
imaginations	pilgrimages
imaginative	unimaginable
imaginatively	unimaginably
imagine	unimaginative

2) Use the same process and tools to find a family of words that links these words <bankruptcy>, <disruption> and <eruption>! Can you build a matrix on your own?

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

Questions & discoveries sparked by investigating <imagine>!	Some of the "Big Ideas" developed and reinforced through these investigations:
<ul style="list-style-type: none"> <li>Is there an &lt;-ation&gt; suffix like the dictionary says or is it an &lt;-ate&gt; suffix followed by an &lt;-ion&gt; suffix?</li> <li>I can't seem to make &lt;imagination&gt; work with the &lt;-tion&gt; suffix.</li> <li>When stuck making a word fit into a word matrix, make sure to use a word sum to carefully look at the structure of that word.</li> <li>Does &lt;imagery&gt; use an &lt;-ery&gt; suffix or a &lt;-ry&gt; suffix?</li> <li>Is there such a thing as a &lt;-cy&gt; suffix? It looks like I need one for the word &lt;bankruptcy&gt;.</li> <li>Why is there a &lt;ɪ&gt; in &lt;bankruptcy&gt; when I don't pronounce it?</li> <li>Can there be a base &lt;rapt&gt; even though there is no word &lt;rapt&gt;?</li> </ul>	<ul style="list-style-type: none"> <li>Scientists search for the most elegant solution. A principle of scientific inquiry is to look for the deepest structure that explains the largest number of cases.</li> <li>Effective learners are critical thinkers who know to question even authoritative sources with evidence. They look to more than one reference before drawing strong conclusions.</li> <li>Effective learners have strategies they know to use when they get stuck on a problem.</li> <li>Effective learners are skilled at identifying and testing hypotheses.</li> <li>Effective learners are comfortable working with questions that have ambiguous answers. The learning through the process of an investigation is often more valuable than a specific answer.</li> <li>English spelling is an ordered system that prime function it to represent meaning. It can be investigated and understood through careful problem solving.</li> </ul>

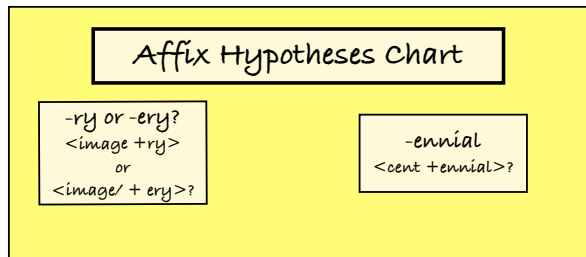
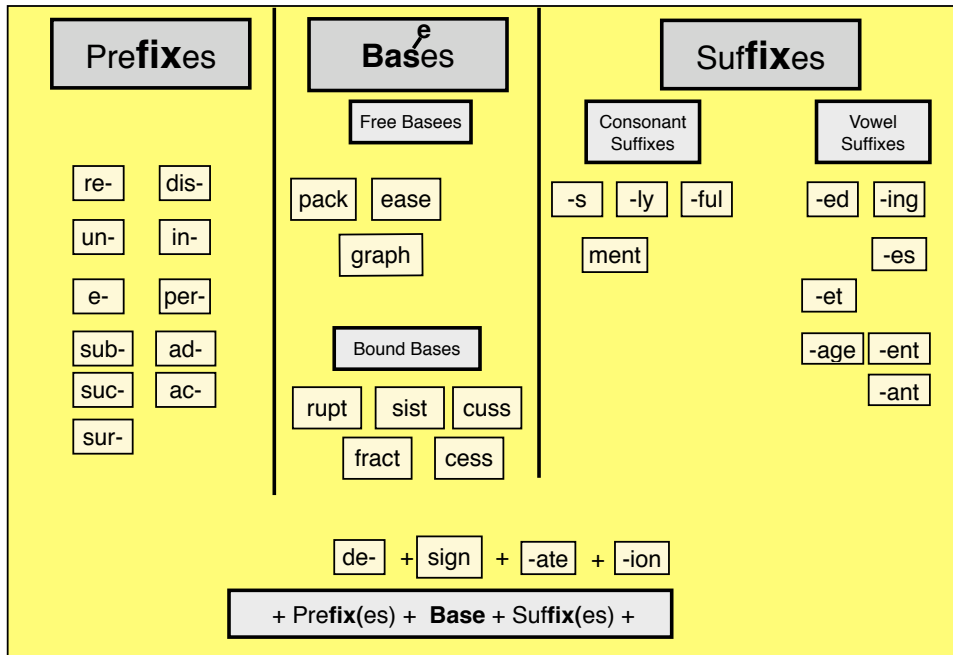
Answer Key (Other organizations of the same morphemes are possible)

un	image	ry es ed ing  (Why not <-ery>?)											
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[WWW.WORDWORKSKINGSTON.COM](http://WWW.WORDWORKSKINGSTON.COM)

For more on this lesson and ideas for related inquiries, go to this link: [http://web.mac.com/peterbowers1/Site\\_29/Enduring\\_Understandings\\_from\\_imagine\\_lesson.html](http://web.mac.com/peterbowers1/Site_29/Enduring_Understandings_from_imagine_lesson.html)

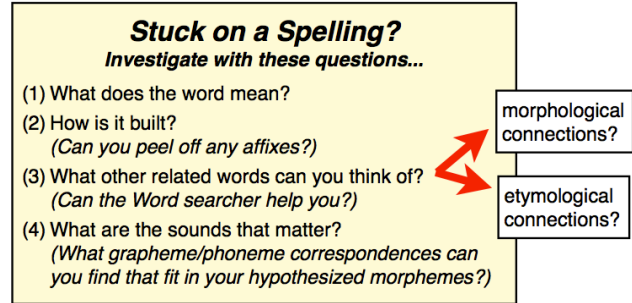
Class Sticky-Note Morpheme Chart



Keep adding bases, prefixes and suffixes to chart above as you encounter them in attested sources (Real Spelling Themes, Dictionary searches) or when you prove them with word sums with which you are confident. As students encounter these morphemes, and you confirm their accuracy by adding them to the chart, they gain in their ability to analyse more words.

Keeping an "Affix Hypothesis Chart" encourages students to share the ideas they have about possible new affixes as they are encountered. By placing them on this chart, other students know not to trust these suffixes yet. On a regular basis the teacher can take up the hypothesized affixes and model using word sums and dictionaries to prove or disprove them. The proven ones get attested on the official chart. In my experience, students are always proud to get their affixes attested and not embarrassed when theirs is shown not to work. I make it a rule for students to include hypothesized word sums and their names to put up their hypotheses. Be ready for this chart to get filled up quite quickly with great theories! Affixes that you can't resolve can be placed on the "Wonder Wall" shared with other classes. If they remain unresolved, email Pete and Melvyn to see if we can find an answer!

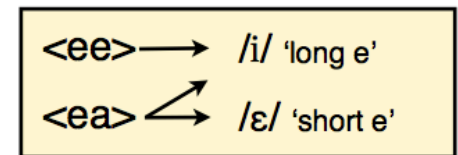
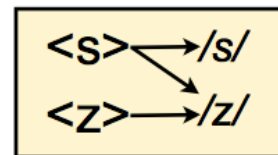
Steps for orthographic problem-solving



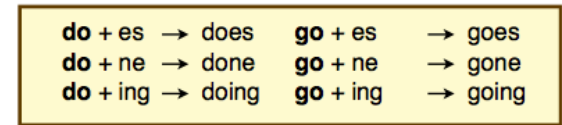
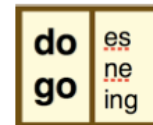
Function Words	Content Words
or to be  he she on in	ore oar too two bee  homophones If one of a set of homophones is a function word, it will use fewer letters than its homophone(s).

• Only function words use one or two letters (they can use more).  
• Content words use at least three letters.

Build up grapheme-phoneme correspondence charts as you study them.



Matrix word sum pairs can be used to highlight high frequency words you have studied, but use those words as tools for making sense of the wider system.



A selection from pdf of "reference charts" you can find by exploring this link on our website:

[http://web.mac.com/peterbowers1/Site\\_29/WW\\_World\\_Tour\\_Fall\\_09.html](http://web.mac.com/peterbowers1/Site_29/WW_World_Tour_Fall_09.html)



# Integrating word structure knowledge into classroom instruction

## Helping students investigate (and practice) how meaning elements build words is not an end, but a means...

Word building instruction sets the stage for teaching how to untangle meaning cues from complex words - including unfamiliar words that use familiar meaning elements. Morphological problem solving skills are added to the use of context clues to facilitate working out the meaning of new words.

Initial lessons investigating the “mechanics” of word structure look like “spelling instruction”. However, once students develop word knowledge and investigation skills, teachers can start to guide application of that knowledge during any classroom content area.

## Word building (spelling) instruction becomes word analysis (reading) instruction.

All the while children receive engaging, generative **vocabulary** and **vocabulary-learning** instruction.

### Integrate word structure inquiries into story reading.

“I was worried about my snowman melting as spring was coming.”

1. Find the <-ing> suffixes in this sentence.

**melt**+ing --> melting; \*~~spr~~+ing --> **spring**; **come**+ing --> coming

Students learn that the finding the letters <ing> doesn't necessarily mean that they have found an <-ing> suffix. Students learn to look for **structure** and **meaning** in words.

2. Why do we use the word “snowman”?

**snow**+**man** --> snowman

We explain that this is a compound word that is about a **man** made out of **snow**. The word <carpet> is not a compound word because it has nothing to do with cars or pets.

## Spelling Knowledge Supports Science Knowledge...

Students independently apply morphological problem solving to deepen vocabulary and understanding of scientific concepts during science class.

### Condensation

At first when I saw the word Condensation I thought the base was *densat* or *densate* but i wasn't sure. What did it mean? So my friend recognized the "ate" in condensation and we knew we had to have the *ate* insted of *densat* or *densate*. So after we were left with <dens> and *dens* looks like the plurrel of "den" so we added an 'e,' then after that we looked in the dictionary. The word <dense> means “*tightly packed together.*”

### Here are the steps in writing....

step one: condensation

step two: con+densat+ion

step three: con+dens+ate+ion

step four: con + dense +ate + ion

...so we got the base **DENSE!!!!!!!!!!**

**We figured it out!!!!**

“The more that teachers think about relating new terms to familiar terms based on morphology or spelling-meaning criteria, the more they will make connections-- and the more excited they will be come as they share these connections with students.”

## Links & Resources

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

Free resources, images, video clips and descriptions of this instruction in action around the world.

- YouTube [videos](#) of structured word inquiry in practice.
- **WordWorks Newsletter:** Email us at [wordworkskingston@gmail.com](mailto:wordworkskingston@gmail.com) to receive our free Newsletter with updates, Word Detective Episodes and frequent extra resources.
- **Teaching How the Written Word Works** (Bowers, 2009). This book builds on the 20 session intervention study I conducted (Bowers & Kirby, 2010) in Grade 4 and 5 classes. The lessons with the <sign> and <move> matrices are the first lessons in that book. [Email](#) Pete to order a copy.

**Real Spelling** [www.realspelling.com](http://www.realspelling.com)

This is not a spelling program or teaching approach. It a reference that explains how English spelling works. Find many free resources and also excellent resources for sale.

**LEX (Linguist-Educator-Exchange)**

[This excellent blog](#) by Gina Cooke for educators who trying to make sense of the linguistic structure of words.

## On-line Structured Word Inquiry Tools:

**The Word Searcher:**

A key [free tool](#) for collecting words according to surface patterns so that word scientists can investigate the substructure of words. This is an invaluable tool for your spelling investigations.

**Mini Matrix Maker**

A [basic tool](#) for typing word sums and turning them into matrices. See a “how to video” at this [link](#).

**The Word Microscope:**

[This software](#) allows the user to construct matrices from word sums, search for likely members of morphological families and much more. It guides learners in their quest to make sense of English spelling.

**Real Spellers:** [www.realspellers.org](http://www.realspellers.org)

This website by Matt Berman (Grade 4 teacher at [Nueva School](#) in Hillsborough, California) is an excellent site for resources and spelling discussions from teachers around the world.

## Teacher Blogs with Videos, Investigations etc:

- [Dan Allen's Grade 5 Blog](#)
- [Ann Whiting's Grade 7 Blog](#)
- [Jen Munnerlyn's Lliteracybytes Blog](#)

## References

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	<b>Kit K</b>	<b>Kit 1</b>	<b>Kit 2</b>	<b>Kit 3</b>	<b>Kit 4</b>	<b>Kit 5</b>	<b>Kit 6</b>
<b>A</b>	Writing and recognising the vowel letters	The <i/y> conventions: the basic pattern	The trigraph <igh> 2: vowel letter + <igh>	Revisiting suffixing	Consonant letter doubling with polysyllables	The digraph <ui> possible candidate for simplified spelling?	The variable suffix <-able> / <-ible>
<b>B</b>	The suffixes <-ly> and <-ful>	Plurals -1- whether to use <-es> or just <-s>	Grapheme alternatives <ck> / <k> and <tch> / <ch>?	Signs of words from Greek: -1-	Being more precise: 'free' and 'bound' base elements	Words which have an unexpected <h>	Prefixes that have variable forms
<b>C</b>	The suffix <-ing>	When suffixes force doubling -1- monosyllables	The letter <n> and graphemes that contain it	Plurals -2- : when the stem changes, more about <-es>	Letters <o> and <u>: conventions that concern them	Fine tuning of the suffixing conventions	Eponyms
<b>D</b>	The phonology of <c>	The effect of suffixes on the single, silent <e>	Homophones 2 Single-element homophone pairs	'Long' and 'short' <ea> a useful grapheme	Constructing the plurals of words with final <o>	When to use the suffix <-or> instead of <-er>	Heteronyms and homographs
<b>E</b>	Counting syllables	The grapheme <igh> 1: consonant + <igh>	The trigraph <ugh> and other graphemes for the phoneme /f/	The base elements <sci> and <sign>	Using the apostrophe 2: showing possession	Plurals -4- the finishing touches	An etymological project: the names of fabrics
<b>F</b>	Digraphs for 'long' <e>	Early word webs	Two important families: the 'wh-words' <them / they / their>	The <i / y> conventions: the full story	The suffixes <-ion> <-ian> <-ity>	The suffixes <-ery> <-ary> <-ory>	Differences between American and British spelling
<b>G</b>	Phonological matrices -1-	'Long' and 'short' vowels and the single, silent <e>	Graphemes for the 'long U'	Final <dge> or <ge>? The suffix <-age>	When to use the suffix <-t> instead of <-ed>	Compounds -2- fossils, misbehavers and chains	IPA: International Phonetic Association symbol system
<b>H</b>	The suffix <-ed>	Compounds -1-	Letters <w> and <x> their place in English orthography	The phonology of / f /: the full story	Signs of words from Greek: -2-	Twin base elements	Connecting vowel letters
<b>I</b>	Early etymology -1- the families of <hear> and <two>	Homophones -1-	Free base elements with final <f> <l> <s> or <z>	Three useful words: <dissect> <disease> <disaster>	Double <cc> is rare in English spelling	Portmanteau words ( blends )	The grapheme <ugh> the full story
<b>J</b>	Digraphs for 'long' <a>	Phonological matrices -2-	The suffixes <-er> <-est> <-ist>	The spelling of numbers	Choosing between final syllabic <le> and <-al>	The twin bases <cede> / <cess> <sede> / <sess>	A project with the word <privilege>
<b>K</b>	Early etymology -2- the family of <one>	Learning from <love>	Learning from the spelling of <was>	Homophones -3-	Graphemes for the phoneme /B/	Homophones -4- and <i>holorimes</i>	Words from Arabic
<b>L</b>	Early phonetics: 'tasting' for consonants	Digraphs for the 'long' <o>	Naming the days of the week	Using the apostrophe 1: marking contraction	The suffixes <-y> <-ie> <-ee>	An etymological project: words to do with stars	Basic phonetics: voiced consonants; the shewa

TBox 2

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