Beyond the Word
an orthographic learning journey
Lyn Anderson

WordWorks
LITERACY CENTRE
www.WordWorksKingston.com

Structured Word Inquiry
The Joy of Understanding Spelling
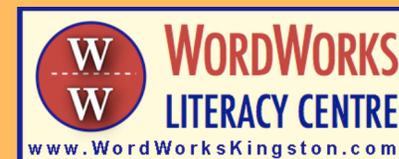
re de	con	struct *"build"*	s ed ing ion or
in	de		ive	ly ity ness
in ob sub super infra			ure	es ed ing
				al	ly ism ist

struct + ure/ + ed → **struct**ured

in + **struct** + ion → in**struct**ion

Instruction which *builds* understanding of word *structure* as a tool for investigating the the interrelation of spelling an meaning.

dis en courage "heart" ed ing ment s ous ly

Peter Bowers & Lyn Anderson

**SWI Workshops
Jan 30 & Feb 6, 2016
@ The Nueva School**

THE Nueva SCHOOL

Guides for Structured Word Inquiry

## Two Guiding Principles of Structured Word Inquiry

😊 ***The primary function of English spelling is to represent meaning.***

😊 ***The conventions by which English spelling represents meaning are so well-ordered and reliable that spelling can be investigated and understood through scientific inquiry.***

Scientific inquiry is necessary to safely guide spelling instruction and understanding.

😊 ***Scientific inquiry is the only means by which a learning community can safely accept or reject hypotheses about how spelling works.***

Click here for a full draft document expanding on these ideas, including definitions of key concepts and terms.

A model of English orthography from www.realspelling.com
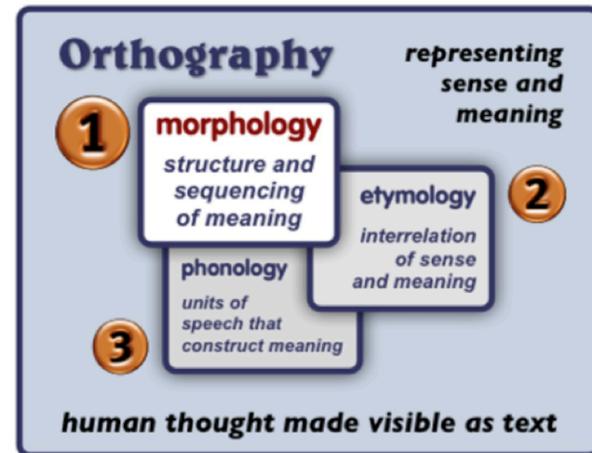
Process of "Structured Word Inquiry"

1) Prompt 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 convention that explains the original question.

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.

Found an interesting word?

*In**vestig**ate with these 4 questions...*

1. What does the word mean?

2. How is it built?

↕ • *Can you identify any bases or affixes with a word sum?*

3. What other related words can you think of?

• ***Morphological relations***: *Can the Word Searcher help you find words that could join your word on a matrix?*

• ***Etymological relations***: *Can a word origin dictionary (e.g. Etymonline) help you?*

4. What are the sounds that matter?

• *What grapheme/phoneme correspondences can you find that fit within your hypothesized morphemes?*

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

Click here for lessons investigating the spelling of <know> inspired by Robb's story.

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.

Touching on the Research

Research has long emphasized the importance of letter-sound knowledge for literacy development (e.g., Adams, 1990; Rayner et al., 2001). There is an enormous amount of research showing that instruction which explicitly teaches grapheme-phoneme correspondences and phonemic awareness is more effective that "whole word" based instruction which does not emphasize the internal structures of words. That evidence, however, says nothing about the effect of teaching about morphology, or the interrelation of morphology and phonology. Nevertheless, many researchers and research models recommended not addressing morphology until later years. In her seminal 1990 book, Adams wrote,

> *"Although teaching older readers about the roots [base morphemes] and suffixes of morphologically complex words may be a worthwhile challenge, teaching beginning or less skilled readers about them may be a mistake" (p. 152).*

The following 20 years of research largely behaved as though there was clear evidence supporting this hypothesis. In 2010 meta-analyses of morphological interventions were finally conducted (Bowers & Kirby, 2010; Goodwin & Ahn, 2010; 2012) to test that assumption. The exact opposite was found.

Not only did morphological instruction help students in general, *less able and younger students gained the most from morphological instruction.* Devonshire, Morris, & Fluck (2013) Conducted an intervention with 5-7 year olds that compared an experimental group with instruction of the interrelation of morphology, phonology and etymology with word sums and matrices to best practice phonics like instruction. They found significant effects on standardized measures of reading and spelling for the experimental group. There is no research evidence showing that phonology needs to be taught before morphology.

Meta-Analyses & Reviews of Morphological interventions

Authors	Findings	Journal
Reed (2008) 7 studies	• Benefits overall • Especially less able (not statistical meta-analysis).	*Learning Disabilities Research & Practice*
Bowers, Kirby & Deacon (2010) 22 studies	• Benefits overall • Largest effect for less able • Effects for Pre-School to Gr. 2 ≥ Gr. 3 -8	*Review of Educational Research*
Goodwin & Ahn (2010) 17 studies	• Significant effects for less able (studied children with learning disabilities)	*Annals of Dyslexia*
Carlisle (2010) 16 studies	• Benefits overall even with youngest students.	*Reading Research Quarterly*
Goodwin & Ahn (2013) 30 studies	• Benefits overall • Significant differences in effects for English speaking students for MA, PA, Vocab, decoding, spelling (not RC) • Larger effect sizes with younger students	*Scientific Studies of Reading*

The best evidence is that we should teach how the writing system works from the start. See a teacher friendly review of the research here.

It makes sense that learning letter-sound correspondences would be facilitated by a fuller *understanding* of how they operate within the morphological frame. 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).

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.

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 go	ing 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)

Links to Structured Word Inquiry Videos

Click here for a tutorial video showing how beginners can use the Word Microscope to guide an investigation through a stud of the word <discovery>.

Click here for an inspiring video on Lyn Anderson's "Beyond the Word" Blot. It shows 5-year-old students investigating the word <carnivore> and some of its surprising relatives in Etymonline.
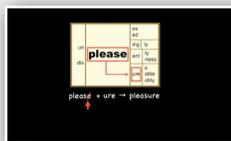
Click here for a video of a tutoring session with a 7-year old investigating the meaning-spelling connections between words with the matrix and word sum.

Click here for an inspiring video / post from a Grade 5 public school with students describing their experience learning through structured word inquiry. See a WW Update on this post here.

Click here to see Etymonline author Douglas Harper discuss an investigation with Pete linking <spice> with many surprising relatives. So rich!

Click here for a Grade 7 student explaining his understanding of the political world through linguistic analysis of the word <dissent>.

- Explore a bank of videos of structured word inquiry in classrooms at this YouTube page.
- See the process of SWI investigations (inc. videos) at THIS NEW ARCHIVE.

The word matrix
(www.realspelling.com)

un in re con	**quest** *Latin Root* *quaerere* *'ask, seek, gain'*	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**. (Real Selling tutorial films on morphology [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)](#).

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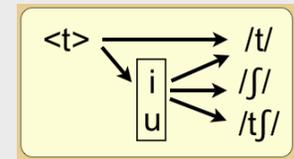
Graphemes comprised of single letters or 2- or 3-letter teams that represent a phoneme. They occur within morphemes.

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)
do ing es ne	<do>	/du:/	do + ing → doing
		/dʌ/	do + es → does do + ne → done

Alternate investigations of the same word family.

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Grade 4s investigate the structure of <knowledge>!

Circle the base <know>

Write out the word sum for each word. Spell it out-loud as you write it! Remember to announce the <kn> and <ow> digraphs, and pause at the plus signs!

known

knows

knowable

knowing

unknown

knowingly

unknowingly

knowledge

knowledgeable

know

prefixes

un-

suffixes

-ing   -n   -s

-ly   -ledge   -able

Investigate the structure of <knowledge>!

WordWorks
LITERACY CENTRE
www.WordWorksKingston.com

1. Analyze these words with word sums according to the hypothesis that they share the base <know>. (Can you prove all the affixes?)

2. Represent analyzed words in the Matrix.

known

knows

knowable

knowing

unknown

knowingly

unknowingly

knowledge

knowledgeable

unbeknownst

know

Structured Word Inquiry Activities...

What is the name of this word family?

?

Word Bag

- playfully
- replay
- playful
- player
- ballplayer
- playmate
- playing

---

1) Which of the words in this "Word Bag" belong in the same family as <pleasure> and <displease>?
2) What is the name of that family?

pleasure

?

displease

Word Bag

- plea
- ease
- unpleasantly
- east
- unpleasant
- pleas
- plead
- pleasing
- pleasurable
- peas

please/ + ing —> pleasing

<please> Word Family

please	ure	able

displease — pleasing

please

→ pleasure

→ unpleasant

pleasurable

unpleasantly

please/ + ure/ + able —> pleasurable

prefix — **Base** — suffix

---

3 Kinds of Word Families

Semantic Family

- displease
- plea
- plead
- pleasing
- happy
- pleasurable
- pleasing
- lovely
- placid
- unpleasant

Morphological family
(common *base element* and *root*)

please

Etymological family
(common *root* different **base element**)

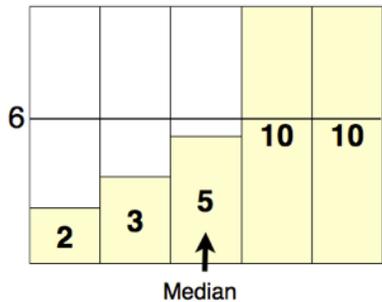Latin *placere* "to be acceptable,
be liked, be approved,"

please/ + ure —> pleasure

prefix — **Base** — suffix

See next page for a description of how to use the "structured and meaning test" to see clarify this task and for links to related resources.

What words are in the middle?
Etymological and *Morphological* Relatives

mode

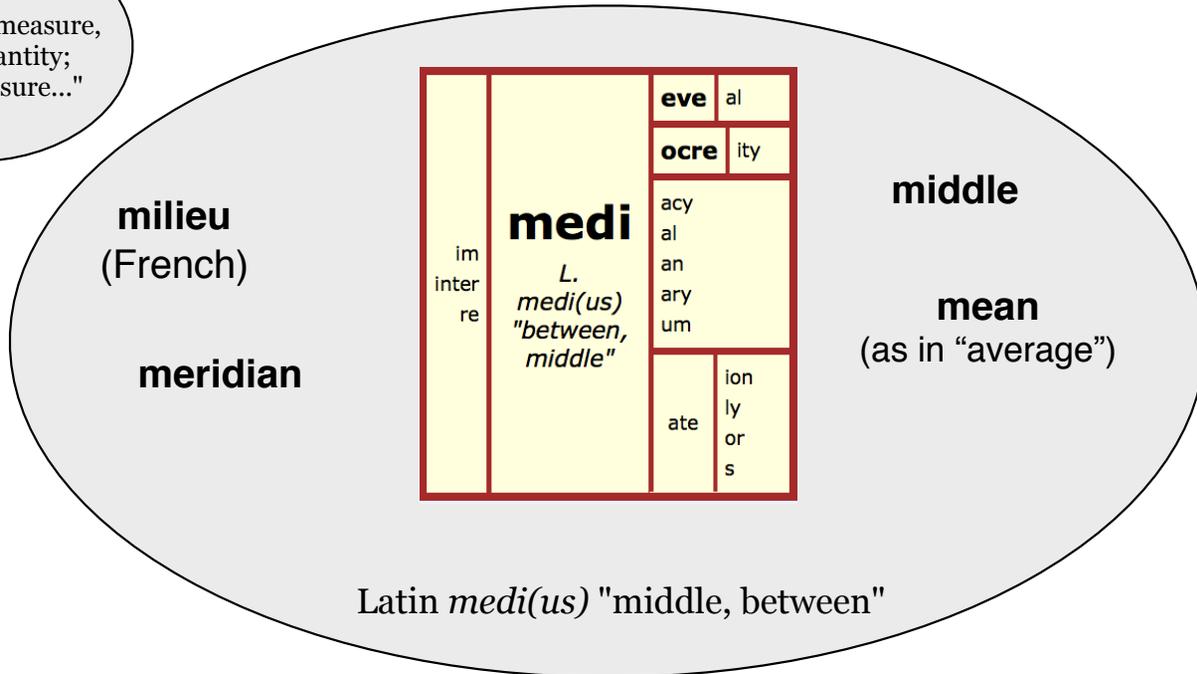L. *mod(us)* "measure, extent, quantity; proper measure..."

milieu
(French)

meridian

medi

L. medi(us) "between, middle"

im
inter
re

eve | al
ocre | ity
acy
al
an
ary
um
ate | ion
ly
or
s

middle

mean
(as in "average")

Latin *medi(us)* "middle, between"

6

10 | 10

5

2 | 3

Median

Total = 30

Mean (average) = 30 ÷ 5 = 6
Median = 5
Mode = 10

Etymological family

All the words within the oval (including those represented by the matrix) are in the same **etymological family** because they share the Latin root '*medi(us)*' with the sense of "middle, between".

Note that <mode> is not in the circle (etymological family) because it has a different root.

Morphological family

The words represented by the matrix with the bound base <medi> share not only that same *root,* but they also share the same *base element* spelled <medi>. To test whether a word belongs in this matrix, ensure that is has the same root, and then construct a word sum linking to the base <medi>.

- See how the words <middle> and <median> can share a meaning *without sharing a base?*
- When you understand the math concepts of <median>, <mean> and <mode>, why does it make sense that <median> and <mean> are related by a family that has to do with the idea of "between, middle" but <mode> is NOT related?
- Which sense, *extent*, *quantity* or *proper measure*, do you associate with the math concept of "mode"?

Etymological and Morphological Relatives of the Free Base Element <sense>
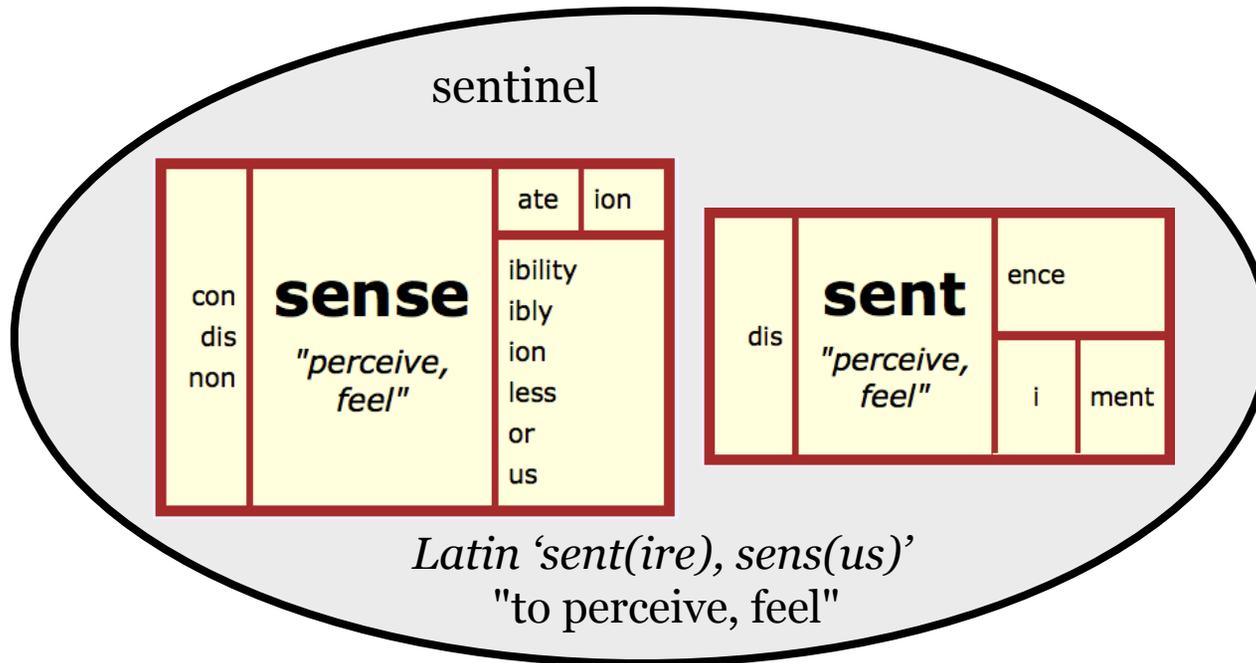
Word Sums for <sense> matrix

sense/ + or	➔	sensor
sense + less	➔	senseless
non + sense	➔	nonsense
sense/ + ibly	➔	sensibly
dis + sense/ + ion	➔	dissension
con + sense/ + us	➔	consensus
sense/ + ibility	➔	sensibility
sense/ + ate/ + ion	➔	sensation

sentinel

con
dis
non

sense
"perceive, feel"

ate | ion

ibility
ibly
ion
less
or
us

dis

sent
"perceive, feel"

ence

i | ment

Latin 'sent(ire), sens(us)'
"to perceive, feel"

Word Sums for <sent> matrix

dis + sent	➔	dissent
sent + i + ment	➔	sentiment
sent + ence	➔	sentence

Paragraph for <sense>

Decision by consensus vs majority rule
It is more difficult for a group to arrive at a consensus on a decision compared to majority rule. That hard work, however, helps everyone feel that their opinions have been heard and respected.

Observations / Reflections / Questions
- At first I had just the <sense> matrix, but then I noticed that three of my words shared the <sent> base, so I added the second matrix.
- I was not sure how to analyze <sentinel>. I didn't know what to do with the <inal> part, so I left <sentinel> as a base for now. Since it seems to be in this etymological family I left it in the circle.

- The suffixes <-ibility> and <-ibly> made me wonder. It is hard to believe <-ibility> is just one suffix. We tried <-ible + ity>, but this doesn't explain the <i>. The Oxford describes <-ibility> as a suffix forming nouns and gives the example of <accessibility> which works with a word sum with the base or stem <access>. Until I find a way to analyze <-ibility> deeper, I will treat it as a suffix until I find a deeper analysis.
- I wonder if there are more morphological families that grow from the Latin root *'sent(ire)'*.
- I'm curious to better understand the connection between the idea of "perceive, feel" and the word <sentence>.
- I'm curious about the Latin root "sensus' for "perceive feel" too. I wonder if that explains the spellings <sense> and <sent>. I've heard of 'twin bases' and wonder if that might relate here.

Name_____

Activity Sheet #1
Word Building: Using a Real Spelling™ Word Matrix

A WORD MATRIX USUALLY ONLY SHOWS *SOME* POSSIBLE WORDS. YOU CAN OFTEN 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.
- 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.

re			al
as		**sign**	ing
			ed
			er
			ment
re	de		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>

8

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		s
un	**move**	ing
		ed
		er
		ment

move + s   → moves
move + 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>)

12

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?
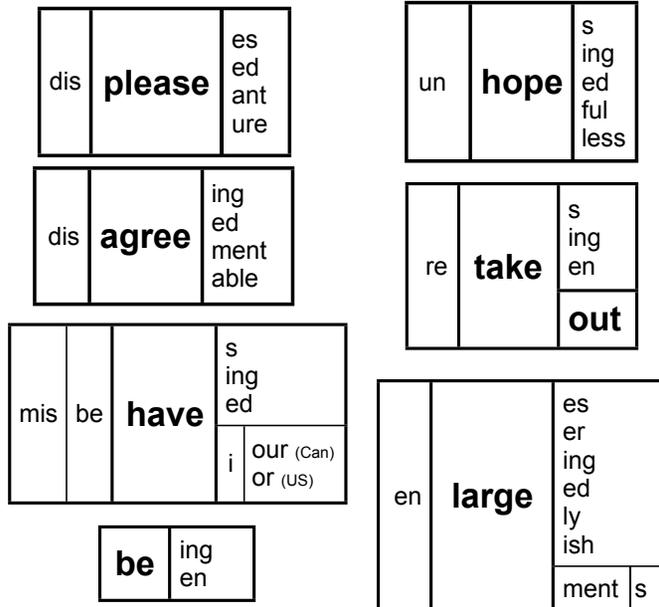
Real Spelling Tool Box Connections

1D - The effect of suffixes on a single, silent <e>
1B - Making plurals - 1- whether to use <-es> or just <-s>
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 -1- (Make sense of the silent <e> in <please>)
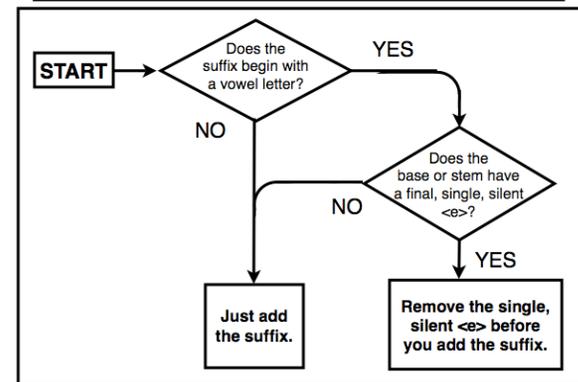1H - Compound words -1- (Does <takeaway> break suffixing conventions?)

15

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

18

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

Spelling Out & Writing Out Word Structure

Do these activities with guidance of the "Constructing Word Sums Booklet" (click here). Explore this page and this page for more on spelling out word structure.

Synthetic word sums:
1. Mark suffixing changes on left.
   (See tools for suffixing conventions here and here.)
2. Spell out and write out your word structure hypothesis n the right side of the re-write arrow following the conventions in the "Constructing Word Sums Booklet".

Analytic word sums:
1. Spell out your hypothesis of the structure of the given word *without* the scaffolding of a completed word sum with a partner.
2. Test your hypothesis (or hypotheses) by writing out the substructure on the right of the word sum.

Note: To spell out the word structure in the "Analytic Word Sums", you need to identify whether the starter word is a base, or if it is complex.

Synthetic Word Sums

Substructure	→	Surface Structure
spring	→	spring
care + ful + ly	→	carefully
spell + ing	→	
cute + er	→	
cut + er	→	
act + ive + ity + es	→	
busy + ness	→	
busy + body	→	
graph + eme + ic	→	
phone + o + log + y	→	
un + heal + th + y + ly	→	
nate + ure + al + ly	→	

Analytic Word Sums

Surface Structure	→	Substructure
reach	→	
react	→	
does	→	
pliers	→	
duckling	→	
spilling	→	
rightfully	→	
logically	→	
disruptive	→	
assistance	→	
sisterhood	→	
bookkeeper	→	

Videos of teachers and students spelling out word structure with word sums and working with matrices
- The word sum is the basic linguistic tool for analysis of morphological word structure. See Real Spelling tutorial films on this topic here.
- Visit the WordWorks YouTube page for many videos illustrating and integrating spelling-out word structure into everyday instructional practice.
- See a Skype tutoring session with a Grade 2 student using spelling out of word structure with word sums and the matrix.

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.

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

A Generative *Word Wall*: The Classroom "Sticky-Note Morpheme Chart"

Morphemes on sticky notes and this chart can be used to model the building block nature of words. Over time, a class builds up a bank of morphemes that they then use as a reference in continuing investigations of words. I don't organize the suffixes into vowel and consonant categories until after we discover that convention in *Activity 2*. All along, students want to add new morphemes to the chart. I ended up developing an "affix theory section" next to the chart where students could post affixes they had noticed in words they encountered in any context. These theories of affixes were only placed on the "official chart" when the class was convinced that the student's theory was demonstrated to be an accurate affix that worked with a number of words. More images of these tools in classrooms can be found on the *WordWorks* website.
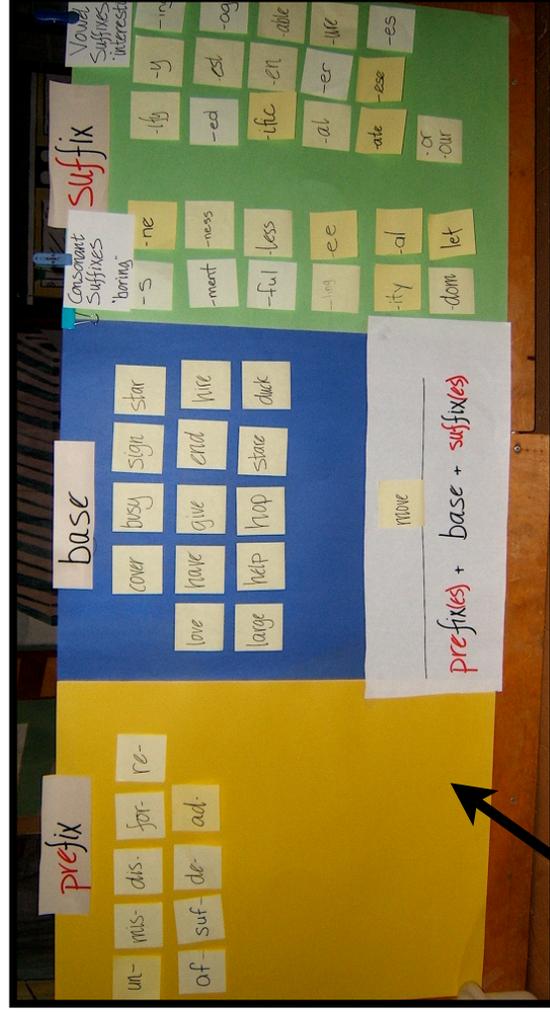
My class morpheme chart starts out with even fewer morphemes than are shown above picture. It keeps on growing as students encounter more and more morphemes during ongoing "word detective" work.

"Affix Theories" section: Students post sticky notes with their theories of affixes. They had to include a word sum using the proposed suffix. It never takes long before I am pestered to take up these theories in class discussions so we could decide which discoveries belonged on the "official chart".

Prefixes
and their variations

this list is not exhaustive

A good dictionary will list prefixes as separate entries

- **a-** (OE)
- **a-** (Gk) / an-
- **ab-** / abs-
- **ad-** / a- ac- af- ag- al- an- ap- ar- as- at-
- **al-** (OE)
- **amb-**
- **amphi-**
- **ana-** / an-
- **ante-**
- **anti-** / ant-
- **apo-**
- **be-**
- **bene-**
- **bi-** / bin-
- **by-**

- **cata-** / cath- cat-
- **circum-**
- **com-** / co- col- con- cor-
- **contra-** / contro-
- **de-**
- **di-**
- **dia-**
- **dis-** / dif- di-
- **dys-**
- **ec-**
- **en-** / em-
- **epi-** / eph- ep-
- **eu-**
- **ex-** / e- ef-
- **extra-**
- **for-**

- **hyper-**
- **hypo-** / hyp-
- **in-** / il- im- ir-
- **infra-**
- **inter-**
- **intra-**
- **intro-**
- **male-** / mal-
- **meta-** / meth- met-
- **mis-**
- **mono-** / mon-
- **non-**
- **ob-** / o- oc- of- op-
- **para-** / par-
- **per-**
- **peri-**

- **poly-**
- **post-**
- **pre-**
- **pro-**
- **re-** / red-
- **retro-**
- **se-**
- **semi-**
- **sub-** / suc- suf- sug- sum- sup- sur- sus-
- **super-**
- **syn-** / sym- syl- sys- sy-
- **tele-**
- **trans-** / tra- tran-
- **ultra-**
- **un-**
- **with-**

Many elements claimed as "prefixes" are not necessarily so.
For instance, <mid> and <fore> are bases, so <midday> and <forecast> are actually compound words.

START
with a word sum

This suffix checker covers *almost* all cases of suffixing.

does the suffix begin with a vowel letter?

does the base or stem taking the suffix end with a vowel letter?

does the base or stem end with < y >?

is the letter before that < y > a vowel?

change the < y > to < i > before you add the suffix

does the base or stem end with < w > or < x >?

is there just one consonant letter at the end of the base or stem?

is there just one vowel letter immediately before that single consonant?

the < u > in the digraph < qu > doesn't count as a vowel letter

is the base or stem a monosyllable?

ignore this box if you are writing US English

is the last letter < l >?

is the stress on the syllable just before the suffix in the finished word?

just add the suffix

double the last letter before you add the suffix

Except for < ing >, suffixes that begin with < i > don't usually force consonants to double **but they still replace a single silent < e >**

is that vowel letter a single silent < e >?

does the base or stem end with < y >?

is the letter before that < y > a vowel?

does the suffix begin with < i >?

change the < y > to < i > before you add the suffix

does the base or stem end with < ie >?

does the base or stem end with < ye > or < oe >?

remove the < e > and replace it with the suffix

is the suffix < -ing >?

are you adding the suffix < -ing >?

remove the < e > AND change the < i > to < y > before you add < -ing >

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	Kit 1	Kit 2	Kit 3	Kit 4
A	The <i / y> relationship Part 1	The trigraph <igh> 2 : vowel letter + <igh>	Revisiting basic suffixing patterns	Consonant letter doubling with polysyllables
B	The plural suffix <-(e)s> The basic pattern	Grapheme alternatives <ck> / <k> and <tch> / <ch>?	Signs of words from Greek: -1-	Being more precise: 'free' and 'bound' base elements
C	Consonant letter doubling with monosyllables	The letter <n> and graphemes that contain it	Constructing plurals When the base or stem changes	Letters <o> and <u>: conventions that concern them
D	The functions of final single non-syllabic <e>	Homophones 2 Single-element homophone pairs	The several facets of the digraph <ea>	Constructing the plurals of words with final <o>
E	The trigraph <igh> Part 1 : consonant letter + <igh>	The trigraph <ugh> and other graphemes for the phoneme /f/	The base elements <sci> and <sign>	Using the apostrophe 2: showing possession
F	The phonology of the graphemes <c> <k> and <ck>	Two important families: the 'wh-words' and <them / they / their>	The <i / y> relationship Part 2	The suffixes <-ion> <-ian> <-ity>
G	The orthographic phonology of 'long A'	Graphemes for the 'long U'	Graphemes for /dʒ/, the suffix <-age>, final <ge> or <dge>	When to use the suffix <-t> instead of <-ed>
H	Compounding and its components	Letters <w> and <x> their place in English orthography	The orthographic phonology of /f/	Signs of words from Greek: -2-
I	The orthographic phonology of 'long E'	Free base elements with final <f> <l> <s> or <z>	Learning from the spellings <dissect> <disease> <disaster>	Double <cc> is rare in English spelling
J	The lessons of the suffix <-ed>	The suffixes <-er> <-est> <-ist>	The spelling of numbers	Choosing between final syllabic <le> and <-al>
K	Learning from the spelling of <love>	Learning from the spelling of <was>	Homophones 3 Homophones that may be complex	Graphemes for the phoneme /ʃ/
L	The phonology of 'long I' and 'long O'	Naming the days of the week	Using the apostrophe 1: Showing Omission	The suffixes <-y> <-ie> <-ee>

	Kit 5	Kit 6
A	The digraph <ui>	The variable suffix <-able / -ible>
B	Words with unexpected <h>	Prefixes that have variable forms
C	Fine tuning of the suffixing conventions	Eponyms
D	The suffixes <-or> <-er>	Heteronyms and homographs
E	Plurals -4- Final details	Etymological project: names of fabrics
F	The suffixes <-ery> <-ary> <-ory>	American and British spelling differences
G	More about compounds	The IPA symbol system
H	Twin base elements	Connecting vowel letters
I	Portmanteau words	The grapheme <ugh>
J	The twin bases <cede / cess> <sede / sess>	Learning from <privilege>
K	Homophones -4- *and holorimes*	Words from Arabic
L	Etymology: words to do with stars	Voiced consonants The shewa

These Tool Kits are in TBox2 multimedia format

These Themes are being re-written for the Tool Box 2 multimedia format

Links & Resources

Wordworks: 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 to receive our free Newsletter with updates, Word Detective Episodes and frequent extra resources. See a recent example here.
- **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.fr
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 (Get LEX grapheme cards here)

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.

See a short user's manual and "how to video" here.

Real Spellers: 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:

- SWI "Investigations" Resources & videos from Pete on Real Spellers
- Dan Allen's Grade 5 Blog
- Ann Whiting's Grade 7 Blog
- Skot Caldwell's Grade 4/5 Blog
- Mary Beth Steven's Grade 5 Blog
- Lyn Anderson's blog for SWI in the early grades
- Jen Munnerlyn's LIteracybytes Blog

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