Structured Word Inquiry:
Guiding principles -- Key spelling concepts and terms

Structured word inquiry is a phrase first published in the Bowers & Kirby (2010) study investigating the effects of morphological instruction in Grade 4/5 classrooms. It was coined to describe an approach to instruction about the written word which applies the principles of scientific inquiry to the spelling-meaning structure of words. This instructional frame is used in all of WordWorks resources, including my teacher resource book based on that 2010 intervention study.

This document is not intended as an introduction to structured word inquiry. I created it is as a reference to help individuals consolidate the concepts addressed in WordWorks workshops, but I hope it is useful to others as well. Those who have been working with resources such as Real Spelling, LEX, Real Spellers, and/or Neil Ramsden's on-line tools for spelling investigations should find it useful. If this document is your introduction to structured word inquiry, I recommend that you explore the many resources available at www.wordworkskingston.com. The "About WordWorks" page is a good starting point.

Two Guiding Principles of Structured Word Inquiry [1]

- 💡 ***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.***

Inquiry learning is rudderless without a reliable means of critically analyzing one's own assumptions and those presented by others.[2]

Extensions & Examples

[1] ***Applying the guiding principles:***

Checking that instruction is in accordance with these principles guards against the acceptance of false assumptions about spelling.

- If instruction signals that the *primary* job of spelling is to represent sound, the first principle is violated. A revision of instruction is required.

- If instruction signals that the inability to explain a given spelling is evidence of an irregular spelling, the second principle is violated. A revision of instruction is required.

[2] Consider the fact that the Oxford on my Mac computer lists <-tion> as a suffix and lists <completion> and <relation> as example words. This supposed suffix is ubiquitous in well-established references, research and educational texts.

I will let the reader use the word sums below to judge for themselves whether these words are more coherently analyzed with a <-tion> or an <-ion> suffix.

$$comple + tion \rightarrow completion$$
$$rela + tion \rightarrow relation$$

or

$$complete/ + ion \rightarrow completion$$
$$relate/ + ion \rightarrow relation$$

Teachers and students require accessible, reliable scientific tools like the word sum if they are going to be equipped to confidently reject a false understanding regardless of the perceived authority of the source presenting that assumption.

Dual benefits of scientific basis of structured word inquiry

If I take the role of a scientist in the classroom I am always looking to revise and refine my own understanding in the face of evidence. Students take on he role of co-investigators who raise questions and see solutions that I could easily miss on my own. This supports student learning in at least two important ways.

1) I provide students with rich experiences working with a mature learner who develops and refines his/her understanding through scientific inquiry. Supporting this type of inquiry-based learning is a central to the mission statements of most schools.

2) By continually developing and refining my own understanding of the spelling system through scientific inquiry in the classroom, my understanding of spelling and how to investigate new questions grows every year. Every year, I am better equipped to more accurately explain to my students the conventions by which English spelling represents meaning to my students.

Two Foundational Principles of any Scientific Inquiry

- 😊 ***Scientific inquiry seeks the deepest structures that account for the greatest number of cases.***

And the related principle...

- 😊 ***Scientific inquiry seeks the most elegant solution.[1]***

English Orthography -- Our Spelling System

Orthography is the writing system (spelling system) that represents the meaning of a language to those who already speak that language.

English orthography represents meaning via three interrelated dimensions: morphology, etymology and phonology. Morphology is the organizing, delimiting framework.

English orthography is the content of the domain that is investigated scientifically though the instructional approach I describe as structured word inquiry (Bowers & Kirby, 2010).

Extensions & Examples

[1] What is the "most elegant" solution?

One way of thinking about the principle of elegance is to say that the most elegant solution is the one that explains the data while invoking the fewest entities.

But what does that mean and how does it relate to spelling?

Consider this common issue people encounter early in their spelling investigations.

Is the suffix in a word like <pleased> spelled <-d> or <-ed> and how can I know?

The *inelegant* case for the <-d> suffix in <pleased>:

To analyze <pleased> with a <-d> suffix, we would have to argue that our spelling system has a <-d> suffix that is used in the case of a base ending in a single, final, non-syllabic <e> and the <-ed> in other cases. This argument requires us to invoke two entities: <-d> and <-ed>.

**The *elegant* case for the <-ed> suffix in <pleased>:**

The <-ed> suffix is a vowel suffix. Like all vowel suffixes, it replaces final, single, non-syllabic <e>s.

The second solution is more elegant as it invokes fewer entities (just one suffix) to describe the same number many cases.

Click here for video illustrating an example of exploring these principles through spelling in an elementary class.

For related descriptions of scientific principles, investigate the *principle of parsimony* and/or *Occam's razor*.

See more on the concept of elegance as it relates to the scientific study of spelling here.

Model of English orthography from Real Spelling
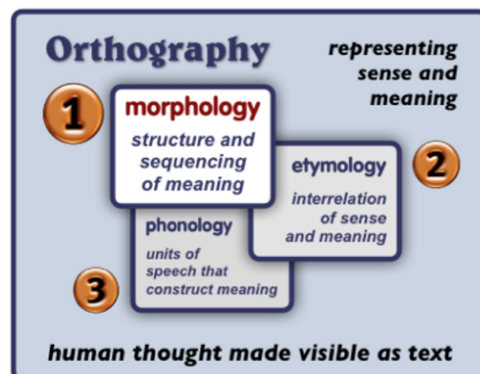
Orthographic Morphology (written representation of morphology)

Some key terms:

morphology	*element*	*stem*	*simple*
orthographic morphology	*prefix*	*consonant suffix*	*complex*
morphophonemic principle	*suffix*	*vowel suffix*	*compound*
morpheme	*affix*	*word sum*	
base	*connecting vowel letter*	*matrix*	

- 🔵 **Morphology** is the system by which the morphemes (bases and affixes) are combined to represent the meaning of words. *Every word is either a base or a base with another morpheme fixed to it.*

  Morphology has a spoken and a written dimension. In linguistics, morphology is usually used in reference to *oral* language. Literacy instruction, on the other hand has a particular need for understanding of orthographic morphology.

  Instruction that accurately represents how our writing system functions requires a clear understanding of the ways oral morphology works in English and the conventions by which that feature of our language is represented in writing -- orthographic morphology.

- 🔵 **Orthographic morphology** refers to the conventions by which morphology is represented in spelling. It provides the primary organizational framework for the conventions of English spelling[2].

Extensions & Examples

[2] What does it mean to say that morphology provides the primary organizational framework to English spelling?

One way to understand the primary role morphology takes in spelling is to recognize that no structural unit of spelling can cross a morphemic boundary.

What does that mean?

Consider the following pair of words:

<reach>

<react>

Both of these words share the letter sequence <ea>. How do we know which uses the structural unit of the <ea> digraph?
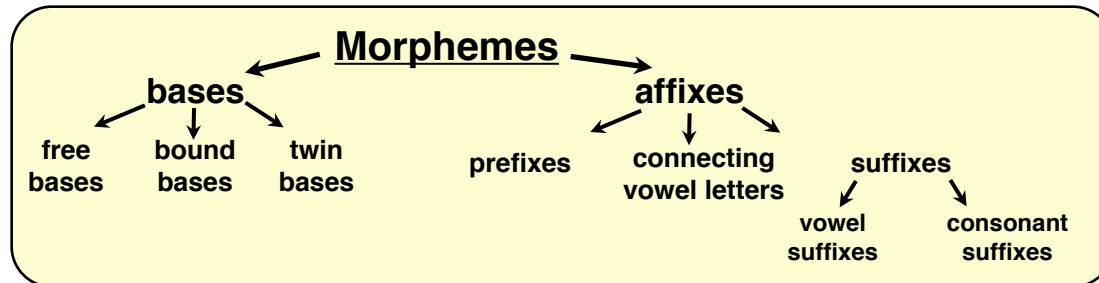
<reach>

<re + act>

Only when we establish the orthographic morphological structure of these words can we be confident in the graphemic structure. Graphemes that are composed of two or three letters *never cross a morphemic boundary*.

Once we understand that graphemes only occur within morphemes, we can start to understand what it means to say that orthographic morphology is the primary organizational feature of English spelling.

As shown with <reach> and <react>, we can't safely address the graphemes in these words until we establish the morphological structure. (See page 8 for more on the primacy of morphology.)

For more detail investigate the "Orthographic Elements" film in the Orthographic Morphology Album in the Real Spelling Gallery.

Morpheme: The minimal structural unit of morphology is the morpheme. Morphemes are the meaning-bearing building blocks of words. A morphologically simple word is just a base element. A morphologically complex word has more than one morphemic element. In orthographic morphology, we can analyse the structure of a complex word with a word sum to identify its constituent morphemic elements. There are four types of morphemes that are used to build words: bases, prefixes, suffixes and connecting vowel letters.[3]

```
                    Morphemes
          bases                      affixes

  free     bound    twin                    connecting              suffixes
  bases    bases    bases   prefixes       vowel letters

                                                      vowel          consonant
                                                      suffixes       suffixes
```

Element: In orthography the term *element* refers specifically to a *written morpheme.* Thus by saying "base element" we signal the written representation of a base.

Morphophonemic principle: *This term* refers to the fact that individual morphemes can vary widely in their pronunciation (phonological form) across a family of related words. Because the primary job of spelling is to represent meaning not sound, morphemes with consistent spelling can vary in pronunciation. [4]

Word sum: The orthographic morphological word sum is a necessary tool for scientific morphological analysis. It shows the underlying constituent morphemes of a complex word and any suffixing changes. (See the Big Suffix Checker or Interactive Suffix Checker for suffixing conventions.)

- A **synthetic word sum** shows the process of synthesizing constituent morphemic elements on the left side of the "rewrite" arrow into a complex word on the right side of that arrow. The full form of the written morphemes is shown on the left. Any suffixing changes are marked on the left side of the synthetic word sum.

  e.g., image/ + ine/ + ate/ + ion → imagination

- An **analytic word sum** (also referred to as a 'reverse word sum') shows the morphologically complex word on the left of the "rewrite" arrow and its constituent morphemic elements separated by plus signs on right of that arrow.

  e.g., imagination → image/ + ine/ + ate/ + ion

Extensions & Examples

[3] *Each morpheme type in one word*

The word <misbehaviour> has at least one of each type of morpheme.

**mis + be + have/ + i + our →
misbehaviour**

This word sum reveals the following morphemes:

- the prefixes <mis-> and <be->
- the base <have>
- the connecting vowel letter <-i->
- the suffix <-our>

Note:

a) The hyphens are crucial signals of where affixes fix onto bases or stems.

b) The slash bracket after the final, single, non-syllabic <e> of the base <have> signals that it is replaced by the connecting vowel letter <-i->.

[4] **Morphophonemic Principle:**
For example, consider the varied pronunciations associated with the following morphemic elements:

- The base element <quest> has the pronunciation /ˈkwɛstʃ/ in the word question, <quest + ion>, but /ˈkwɛst/ in the word conquest <con + quest>.

- The suffix <-ed> has three pronunciations:

  - /t/ in the word jumped, <jump + ed>
  - /d/ in the word played <play + ed>
  - /ɪd/ in the word painted <paint + ed>

A word sum need not show a complete morphological analysis to be accurate. The word sum < imagine/ + ate/ + ion → imagination > is not incorrect, it is simply not a full analysis. It shows the process of building the word <imagination> from the stem <imagine>.

A word sum is incorrect if it violates the morphological structure of a word. A coherent word sum for the word <imagination> cannot be formed with a <*-tion> suffix because there is no stem <*imagina> that could build any word.

💡 **Word matrix**: The word matrix is a representation of the interrelated structure of members of an orthographic morphological family.

The matrix below represents the interrelated morphological structure of members of the <image> family. Like a fully analyzed word sum, the matrix shows the full written form of each morpheme. The matrix below presents members of <image> word family that correspond to the three word sums presented.

Word sums used to construct this matrix on the Mini-Matrix-Maker

image/ + es → images

un + image/ + ine/ + able → unimaginable

image/ + ine/ + ate/ + ion→ imagination

Click here for matrix making tools:
Mini-Matrix-Maker or the *Word Microscope*

Notes:
• This matrix was created with the three word sums above. However, the matrix can now be used to construct other words such as <imagine> or <imaginable>.

• Vertical lines in the matrix correspond to the plus signs in a word sum.

• The full form of morphemic elements is shown in the matrix on the left side of these words sums. Only the word sums signal suffixing changes.

For more precision on the matrix and word sums, go to the "Morphology Album" in the Real Spelling Gallery and see the films on "The Real Spelling Matrix" and "The Lexical Word Sum".

Extensions & Examples

Identifying members of a word family

There are two "tests" that one must conduct to determine whether a word is a member of a given word family and can thus accurately be added to a word matrix.

Example investigation:

Is <imaginative> part of the <image> family?

1) The structure test (word sum)

A plausible word sum for <imaginative> must be constructed resulting in a base with the base element <image>.

image + ine/ + ate/ + ive → imaginative

The suffix <-ive> is the only proposed morpheme that is not already in the matrix.

Words such as *active* <act + ive> and *passive* <pass + ive> provide evidence of the <-ive> suffix. This is a vowel suffix, so it is also correct that this suffix should replace the final, single, non-syllabic <e> of the <-ate> suffix in the same way that the <-ion> suffix does in <imagination>.

2) The meaning test (etymology)

For <imaginative> to belong in the <image> family, it must not only share a common spelling of the base, it must also share a common underlying meaning. The meaning of the base is marked by the underlying root of the base. Checking an etymological reference for the root origin of the word <imaginative> shows that it comes from the same Latin root "imago".

Since <imaginative> passed both the structure and meaning test, the matrix could be adjusted to add the <-ive> suffix to represent this words as well.

Orthographic Etymology (written representation of etymology)

Some key terms:

diachronic etymology   synchronic etymology   root   homophone principle   loan word

☻ **Diachronic Etymology: <dia-> 'through' <chron> 'time'**

The influence of spelling and meaning of roots (e.g. Latin, Greek, Old English) on modern English bases and affixes is an example of diachronic etymology.
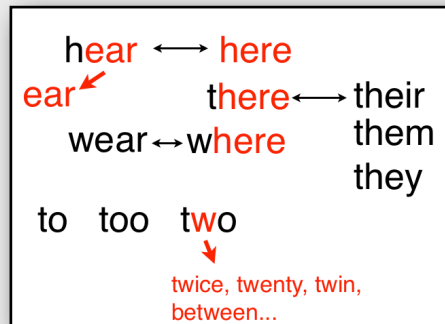
☻ **Synchronic Etymology: <syn-> 'acting or considered together' <chron> 'time'**

Spelling can use letters to mark connections of meaning between words that occurred together -- *at the same time*.

Examples of understanding spellings through synchronic etymology:

• **The homophone principle**
The role of synchronic etymology can also be seen in the choice of graphemes to show links in meaning. For example, the choice of graphemes for the homophones <here> and <hear> is guided by links in meaning to semantically - but not morphologically - connected words. The <ear> for <hear> provides a cue to the word <ear> while the spelling <here> marks a connection to words about place like <where> and <there>.

hear ⟷ here
ear
there ⟷ their
wear ↔ where
them
they
to   too   two
twice, twenty, twin, between...

• **Etymological marker letters**
For example the <w> in the word <two> is an etymological marker marking this word's connection in meaning to words like <twice>, <between>, and <twenty>.

For more detail on these topics watch the Etymology Album of the Real Spelling Gallery and watch the "Orthographic Etymology" films part 1 and 2.

Also see the TEDEd Talk on <onion> and this one on <doubt> by Gina Cooke for more on the etymological influences on spelling.

Extensions & Examples

Diachronic etymology & "the meaning test"

For two words to share a common written base, (base element) they must also be shown to share a common root (origin). Every word on a matrix shares a common underlying denotation of the base. That denotation is identified by the root.

Consider the importance of diachronic etymology and the "meaning test" in an investigation of whether the words <question>, <bequest> and <conquest> belong in the same matrix.

"Structure Test"

All three can be analyzed to show a plausible connection in word structure:

quest + ion → question

be + quest → bequest

con + quest → conquest

All three words pass the necessary "structure test". According to structure, they *could* be in the same morphological family and thus in the same matrix.

"Meaning Test"

To conclude that these words are in fact in the same morphological family and belong in the same matrix, we *also* have to consider diachronic etymology -- the meaning test.

A quick search of Etymonline shows that <conquest> and <question> share a common root, the Latin verb 'quaerere' meaning "ask, seek, gain".

The word <bequest> is from the Old English 'cwis' for "speech". Thus we prove that the word <bequest> does not belong on a matrix for the base <quest> by studying diachronic etymology.

Orthographic Phonology
(written representation of phonology)

Some key terms:

phoneme, grapheme, digraph, trigraph, letter

- A **grapheme** is a single-letter or two- or three-letter combination that represents a phoneme.

  Each type of these graphemes occurs in the word <knight>:

  - **digraph** <kn> for the phoneme /n/

  - **trigraph** <igh> for the 'long i' phoneme /aɪ/

  - **single letter grapheme** <t> for the phoneme /t/

- A **phoneme** is the minimal distinctive unit of sound that can affect meaning in a word.

- A **letter,** in and of itself does not represent any aspect of sound. Letters are the raw material with which various orthographic structures are constructed. Graphemes (which can be comprised of a single letter or sequences of two or three letters) are the spelling structures that represent phonemes, but letters can have many other functions that have nothing to do with the representation of speech sounds. [5]

- Most graphemes can represent more than one phoneme.

- Most phonemes can be represented by more than one grapheme.

- Graphemes cannot cross morphemic boundaries (digraphs & trigraphs can't cross the plus sign in a word sum; e.g., <reach> has an <ea> digraph, but <re + act> cannot.)

- Grapheme choice for a given word is governed by circumstances such as position in a morpheme, word ori gin, the need to distinguish homophones.[6]

Extensions & Examples

[5] **Some non-graphemic functions of letters**
"Marker letters" is a term used to describe letters that play no graphemic role in a spelling. Two common examples of marker letters follow.

- *Plural cancelling marker:*
  There is a convention in English spelling to avoid allowing lexical words appear like a plural if they are not. Words with a final, single <s> can be confused for a plural, so one job of the single, non-syllabic <e> is to prevent a word from being interpreted as a plural (e.g., <nurse>, <house>).

- *Etymological marker:*
  Letters can be used to mark a meaning link between related words (synchronic etymology). For example the <w> in <two> functions to link its connection in meaning to words like <twice>, <twenty> <between>, <twin>, etc.). In this case the <w> also functions to distinguish it from its homophones <to> and <too>. (See Gina Cooke's video on <doubt>.)

[6] **Some circumstances for grapheme choice**
Position:
There are three positions that a grapheme can have in a morpheme: initial, medial or final.

Some graphemes can occur in any position; some are limited to one or two of the possible positions.

For example,
- <kn> is a digraph that only ever occurs initially.

- <igh> is a trigraph that can occur finally (e.g., <sigh>, <high>) or medially (<sight>, <fight>) but never initially.

- <t> is a single letter grapheme that can occur in any position (e.g. <tin>, <fate>, <mat>).

Word Origin (diachronic etymology):
Some grapheme choices signal language of origin. For example in an English word of Greek origin we can expect the /f/ phoneme to be represented by the <ph> digraph.

Distinguishing Homophones (synchronic etymology):
Since <sea> and <see> are identical in pronunciation, different grapheme choices that distinguish the different meanings with different spellings are needed.

Grapheme Choice, Morphology & Etymology

Important!

If you agree that *it is critical for children to be taught about phonology from the beginning of literacy instruction,* consider the following assertions and the evidence that follows.

- *Orthographic phonology (grapheme-phoneme correspondences) cannot be understood accurately without reference to morphology, etymology and orthographic conventions.*

  Thus…

- *Literacy instruction that aims to build an accurate understanding of "letter-sound correspondences" cannot delay teaching about morphology and etymology.*

Many teachers new to structured word inquiry and Real Spelling express the concern that although morphology and etymological are important, that "letter-sound correspondences have to be taught first." This is an understandable initial response, but one that misunderstands how "letter-sound correspondences" work.

Grapheme choices subject to morphological constraints

- *The graphemes of any given word must be able to represent not only the pronunciation of that particular word <u>but also the pronunciation of all the words in the same orthographic morphological family.</u>*

Consider the <ea> in <please>
Without reference to morphology, how can we help a learner understand that the spelling <please> is correct and <*pleese> is not?

When we restrict our study of spelling to possible grapheme-phoneme correspondences, we have no way to understand the choice between multiple grapheme options.

The base word <please> has a "long <e>" phoneme. The <ee> digraph is a way of writing this phoneme. However, this phoneme is **not** present in the related words <pleasant> or <pleasure>. Fortunately the <ea> digraph can represent the phonology of all the words in this family.

un dis	**please**	ing	
		ure	able
		ant	ly ness

please/ + ant → pleasure
please/ + ure → pleasure

The representation of members of a morphological family with a word matrix highlights a central principle of structured word inquiry:

- *We can never understand the spelling of any word in isolation.*

Understanding the morphological constraints on grapheme choice is a *necessary condition* for being able to explain grapheme-phoneme ("letter-sound") correspondences.

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

The fact that consistently spelled morphemes can be associated with varied pronunciations is a foundational principle which guides the evolution of English spelling. This principle occurs in the first written words children encounter. This aspect of spelling can be effectively taught from the beginning of school with appropriate tools.

Words like <does>, <done> and <gone> comply perfectly with the conventions of English spelling. They are typically treated as "irregular" only because the instruction we received failed to understand and represent these principles of spelling. *(See Bowers & Cooke, 2012 for more on this topic with reference to the reading research literature.)*

Etymological influence in <ea> choice in <please>?
We can investigate the diachronic etymology of a word to understand grapheme choice. For example, one clue to the choice of the <ea> digraph in <please> can be found in its Latin root 'placere'. The <ea> digraph is the only grapheme that can represent the /i/ phoneme of the base word <please> *and also include the letter <a> to echo the spelling of the root of this word.*

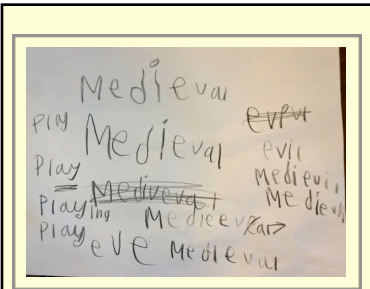*(See page 6 for influences of synchronic etymology on grapheme choice.)*

Influences of orthographic conventions on letter choice?
How can we use phonology to explain the final <e> of <please>?
We can't. The final <e> in <please> plays no role in representing phonology, so it is not even a grapheme. This is demonstrated by the fact that if we remove that <e> we end up with the word <pleas> (for more than one <plea>) which is a homophone for <please> .
Thus the word <please> is an opportunity to teach children about the "plural cancelling marker" (p. 7), and the convention that complete lexical words are not allowed to appear like a plural if they are not. These words also provides the opportunity to teach/reinforce understanding of the homophone principle (p. 6).
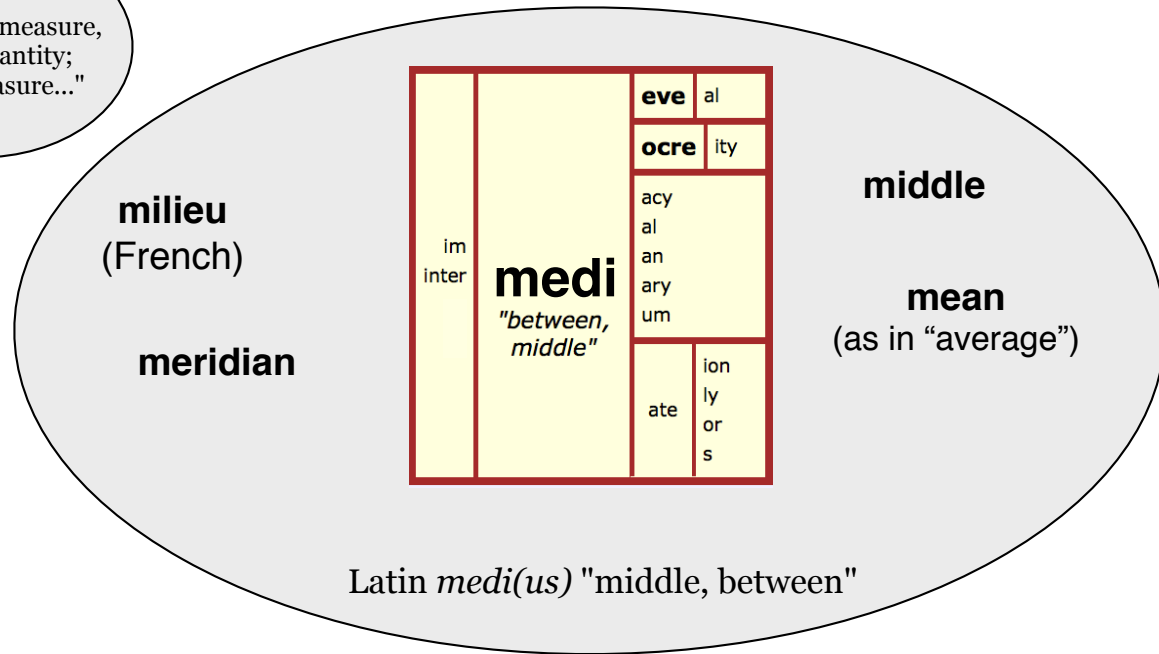
What words are in the middle?
Etymological and *Morphological* Relatives

6 | | | 10 | 10
2 | 3 | 5 | |
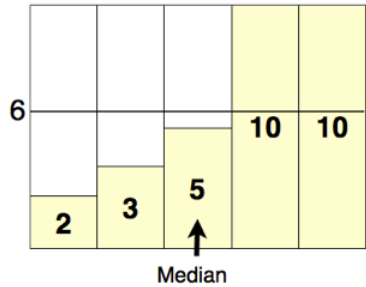
↑ Median

Total = 30

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

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

milieu
(French)

meridian

im inter | **medi** *"between, middle"* | eve | al
| | ocre | ity
| | acy al an ary um |
| | ate | ion ly or s

middle

mean
(as in "average")

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

Above is an image of work a kindergarten student did for fun at home to explain to her parents what she had learned about the word <medieval>. Note that she used <play> and <playing> to model word structure. See this and other stories in WW Newsletter # 81 HERE.

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.
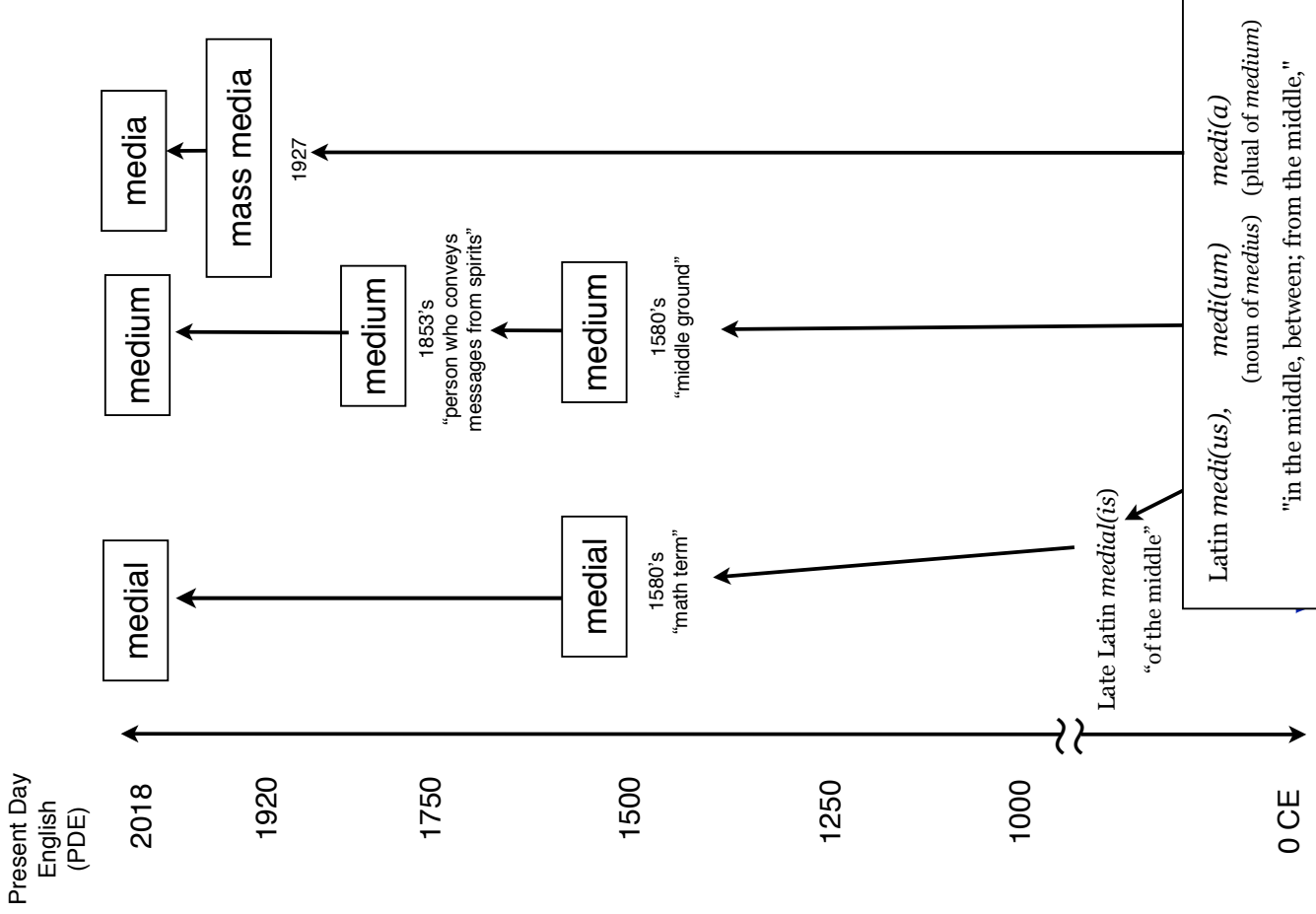
Morphological family

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"?

NOTE! In a previous version of this diagram, I included a prefix <re-> in the matrix to construct the word <remedial> as in "remedial instruction". This hypothesis certainly passed the "structure test". However, a colleague, Gail Venable, brought my attention to the fact that <remedial> *does not* share the Latin root *medii(us)*. Instead, it derives from the Latin root *med(eri)* for "to heal". I am so thankful to be a part of a scinetific community that points out evidence of my errors so that I can drop my own misunderstanding and then stop passing thosse on to that wider comunity. If you find any other challenges to any conclusions in this document, please email me at peterbowers1@mac.com to tle me know!

An "etymological tree" of members of the <medi> bound base

The etymology tree is the attested etymological tool for tracing etymological relationships. These can have the root at the bottom with present day English words at the top, or the reverse. I prefer this version to reflect the metaphor of roots at the bottom.

I created this etymology tree on the same family as shown in the "oval and square" diagram on the previous page. It is important to understand that my "oval and square" model is not a linguistic convention, simply a diagram of my own invention that attempts to reveal the interrelationship of morphological and etymological relatives. A problem with my diagram is that it "flattens time". By contrast, the etymological tree makes that diachronic history clear. I was introduced to the use of a time line on the side by Scott Mills' work. I recommend his resources in on this topic at his excellent website Language InnerViews for Educators LIV(E).

media

mass media

1927

medium

medium

1853's
"person who conveys
messages from spirits"

medium

1580's
"middle ground"

medial

medial

1580's
"math term"

Late Latin *medial(is)*
"of the middle"

Latin *medi(us)*,   *medi(um)*   *medi(a)*
(noun of *medius*)   (plual of *medium*)

"in the middle, between; from the middle,"

Present Day
English
(PDE)

2018

1920

1750

1500

1250

1000

0 CE

Revisiting the guiding principles and concepts of structured word inquiry

This document began by stating these 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.*

If I have done my work accurately, all that followed in this document and in any WordWorks resources can be linked conceptually to one or both of these guiding principles.

Guides for spelling investigations

The charts at right provide a reference for teachers attempting to ensure that their instruction is guided by the inherent structure of the English spelling system.

At top is the model of English orthography presented by Real Spelling. It presents the inherent interrelated nature of morphology, etymology and phonology while simultaneously showing the primary organizing role of morphology.

This orthographic model provides an overview of the content that is the target of study in structured word inquiry. Any instructional practice guided by the principles of structured word inquiry should reflect the concepts presented in this model.

The "Stuck on a Spelling?" chart below builds directly on the orthographic model above. The purpose of this chart is to guide teachers and students with questions they can use in any spelling investigation. The order of the questions is crucial as it matches the hierarchical role of each of the domains of spelling.

Extensions & Examples

Model of English orthography from Real Spelling
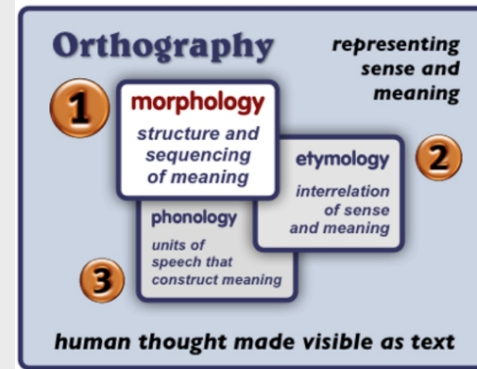
Reference for teachers / students investigating the spelling-meaning structure of English spelling.

Found an interesting word?

1. **What is the sense and meaning of your word?**

2. **How is it built?**
   ↕ • *Can you identify any bases or affixes with a word sum?*

3. **What related words can you find?**
   • *Morphological relatives*: Look for words that share a **base**.
   • *Etymological relatives*: Look for words that share an historical **root**.

4. **What graphemes function coherently here?**
   • Check that they represent the phonemes *across the morphological family*.
   • Check the influence of word origin on grapheme choice.
   • Is what you thought was a grapheme actually an orthographic marker?

Click here for a WordWorks booklet and examples of reference charts for use in classroom and tutoring situations.