

US Department of Education
Reading Institute
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Outside-In Strategy

Morphemic Analysis in Context

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This Session Applies Best to Grades 3-12

The strategic application of morphemic analysis in context is not expected until 4th grade and beyond, as a result of explicit instruction (Baumann et al., 2007)

Its effect is somewhat promising yet uncertain for students with learning disabilities (Carlisle, 2007; Reed, 2008)

However, there is MUCH we can do in grades K-3 to prepare the soil, such as teaching the most common affixes (Henry, 2003, in press)

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What Knowledge is Needed to Implement the Outside-In Strategy?

Joe and Stan arrived at the party at 7:00 o'clock. By 9:30, the evening seemed to drag for Stan. But Joe really seemed to be having a good time at the party. "I wish I could be as sociable as he is," thought Stan.

social + able
society socialize
antisocial sociopath
social worker,
ice cream social

Adapted from Bringing Words to Life Beck, McKeown, and Kucan, 2002

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human, humankind, inhuman, rage, raging, enraged, dehumanizing, outrageous, etc.

Standing with God and the crushed and bleeding slave on this occasion, I will, in the name of humanity which is outraged, in the name of liberty which is fettered [held back], in the name of the constitution and the Bible, which are disregarded and trampled upon, dare to call in question and to denounce with all the emphasis I can command, everything that serves to perpetuate slavery—the great sin and shame of America! from announce to denounce, dethrone to denounce

—Frederick Douglass, "What to the Slave Is the Fourth of July?" speech, presented to the Rochester Ladies' Antislavery Society, July 5, 1852

Morphological Processing in the Mental Lexicon
Bertram, Baayen, & Schreuder, 2000
Baayen, 2007
Carlisle & Katz, 2006
Dorfman, 1998
Nagy, Anderson, Schommer, Scott, & Stallman, 1989


"Kindling students' interest and engagement with words is a vital part of helping all students, but especially less advantaged students, to develop rich and powerful vocabularies"

(Graves, 2006, p. 120)

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Word Play
Blends (aka Portmanteaus)

smog = smoke + fog
dormouse dorm + mouse
chortle
brunch
skort
chocoholic
walkathon



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English Language Learners in Grade 5

“Teaching new words was subordinated to the goal of teaching ABOUT words—various kinds of information about words that could help children figure out meanings on their own”

Carlo, August, McLaughlin, Snow, Dressler, et al., 2004, p. 205

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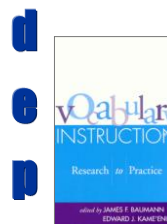
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Students skilled in morphemic and contextual analysis have the potential to increase their vocabulary breadth and depth substantially.

(Edwards, Font, Baumann, & Boland (2004) in Baumann & Kame 'enui, p. 161)

breadth

Note: Efficacy inconclusive for severe reading disability



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Word Play

Are these real words? What might they mean?

- ugsome
- candent
- malductive
- triskaidekaphobia

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A Comprehensive Vocabulary Program Four Components

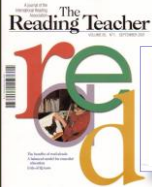
Hypothesized as essential by Graves (2000, 2006)

1. Providing rich and varied language experiences
2. Teaching individual words
3. Teaching word-learning strategies
4. Fostering word consciousness



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“Bumping Into Spicy, Tasty Words That Catch Your Tongue”: A Formative Experiment on Vocabulary Instruction
Baumann, Ware, and Edwards (2007)

Method: Apply the four-ply program Graves (2000, 2006)
The fifth-grade study conducted from September through April with a low-income, diverse population (N = 20) resulted in quantitative and qualitative indicators of increased word knowledge, interest, and self-efficacy.

(Baumann et al. are currently conducting a follow-up controlled experiment)

Richard’s Year-End Reflection

“Before I came to fifth grade, if I read a word that I didn’t know, I wouldn’t take the time to stop. I would just go straight through it. I’d read it and I’d just try to sound it out.... But now I don’t have to do that. I use context clues and everything ... so if I find a word I don’t know, I stop and think about it for a while and then I go on if I figure out what the word means”

(Baumann, Ware, & Edwards, 2007, p. 120)

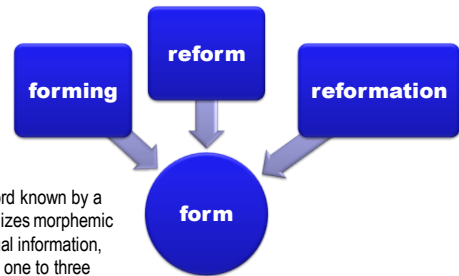
—a formative study conducted from September through April

Use Varied Vocabulary Strategies

- Simmons et al. (2010) carried out a successful experimental study, comparing vocabulary strategy instruction, comprehension strategy instruction, and business as usual on social studies learning in Grade Four (N=903) .

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For every word known by a child who utilizes morphemic and contextual information, an additional one to three should be understandable (Nagy & Anderson, 1984)

But Nation (1990) describes the limits of morphology and Beck, McKeown, and Kucan (2002) describe context that varies from direct to obfuscating

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What Say You? Context Explains Word Meaning:

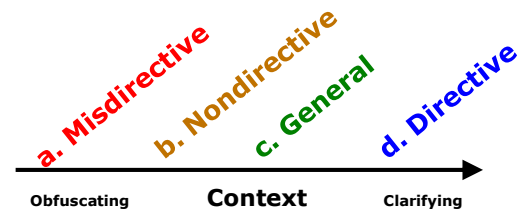
- 90% of the time, or more
- about 75% of the time
- about 50% of the time
- about 25% of the time
- 15% of the time, or less

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The Context Continuum

Source: *Bringing Words to Life* (Beck, McKeown, & Kucan, 2002)



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Different Goals → Different Strategies → Different Results

“Explicit word instruction is more effective and efficient for teaching specific words and increasing text comprehension but has little generalization power.

Morphemic analysis in context presents the potential for students to acquire many new word meanings independently and also to enhance comprehension, but it is not nearly as efficient as explicit instruction for learning a given word.”

Source: Baumann, Edwards, Boland, & Olejnik, 2003, p. 452

And see the book *Teaching Individual Words: One Size Does Not Fit All* (Graves, 2009)

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Morphological Awareness

- The ability and aptitude to use knowledge of morphemes (prefixes, suffixes, roots, and base words) to gain word knowledge
- Also called structural analysis

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Morphology Terminology

Morpheme: The smallest unit of meaning in a word

unlocking has 3 morphemes: un-lock-ing

biographers has 4 morphemes: bio-graph-er-s

Common Morphemes:

word root: inspector, phonics

base word: unlikely light house

prefix: re-, un-, dis-

suffix: -able, -ive, -ly

} **affixes**

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Latin Word Structure

•Structured!

•Prefix + root + suffix as in *invisible*

•Root + root as in *manuscript*

• Latin roots are unlikely to stand as free English words

•Mostly bound morphemes (some free morphemes)

•Latin roots convey meaning

rupt in *erupt*: to break; **dict** in *dictate*: to speak

•There is often a schwa: ə **d**əpt ə ble, ə **d**əpt ə tən

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Linguistic Types

base words boy, farm, cold, steer, act

inflections boys, farmed, farming, colder, coldest, steers, steered, steering, acting

compound words boyfriend, farmhouse, coldhearted, steering wheel, three-act play

derivations boyish, boyishly, boyhood, farmer, Farmington, farmstead, steerage, activation
syntax shift
 nuanced, abstract

(Anglin, 1993; Berko, 1958; Gardner, 2007; Tyler & Nagy, 1989; Wysocki & Jenkins, 1987)

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Those Dratted Derivations!

Which Transformations Are More Complex?

- no shift in orthography or phonology
 - grow-growth; child-childish; compute-computer
- orthographic shift but no phonological shift
 - fame-famous; create-creative
- phonological shift but no orthographic shift
 - courage-courageous; adapt-adaptation; heal-health
- both a phonological and an orthographic shift
 - wide-width; wise-wisdom; divide-division

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Derivational Suffixes



The story of the *Titanic* began before anyone had even thought about building the great ship. In 1898, fourteen years before the

Titanic sank, an American writer named Morgan Robertson wrote a book called *The Wreck of the Titan*.¹ In his story, the *Titan*, a passenger ship almost identical to the *Titanic*, and labeled “unsinkable,” sails from England headed for New York. With many rich and famous passengers on board, the *Titan* hits an iceberg in the North Atlantic and sinks. Because there are not enough lifeboats, many lives are lost.

Do All Words Have a Big Morph Family?

- No
 - not pumpkin
 - not squirrel
 - not mistletoe
 - not sabotage
 - not shun
 - not stringent
 - etc.
 - So, it's worthwhile to focus on large-family words



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Do the Words Share a Morpheme?

- car cars yes
- charm charming
- hot hotel
- merit demerit
- unity union
- act tractor
- sun sunshine
- sun sunken

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SPECT, 'to look, see'

- spectacles
- spectators
- inspect
- inspector
- introspection
- respect
- perspective
- retrospect
- etc. (this is a large morphological family)



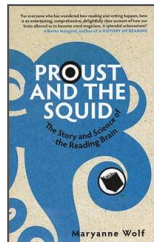
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"Nearly half of incoming freshmen cannot read their textbooks fluently" (Carnegie Corporation, 2002)

This may be true, but...

"Morphological knowledge is a wonderful dimension of the child's uncovering of "what's in a word," and one of the least exploited aids to fluent comprehension" (Wolf, 2007, p. 130)



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MA Explains Vocabulary Variance

- **When controlling for all other tasks...**
 - age, basic reading ability, phonological processing, etc.
 - ...**MA accounts for unique vocabulary variance:**
 - Kindergarten: 8% *** (most K words are monomorphemic)
 - 2nd grade: 15% ***
 - McBride-Chang et al., 2005
 - Many compounds in 2nd grade science and basal rdg (Ebbers, 2008)
- **MA continues to grow over time**
 - 5th grade: ~50% of unique vocab variance
 - Carlsle, 2000

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Does Every Word Belong in the Family?

- sing singer singers sting singing sings
- mother, motherless, mothering, moth, motherhood
- reptile, reptilian, tile, stile, reptiles
- port porter portable export poor import transport
- thermos thermal thermometer thermostat
- healer heal health healthy healthier healthiest
- worry worrisome worrywart worried world

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White, Sowell, and Yanagihara (1989) found that third-graders who were given training on **the nine most common prefixes** and a strategy for decomposing words into roots and suffixes outperformed a control group on several measures of word meaning.

They concluded that teaching at least the top nine prefixes (**if not all twenty**) to middle school students would pay dividends in increased vocabulary learning.

See Graves, 2004, *Teaching Prefixes: As Good as it Gets?*

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20 Most Frequent Prefixes in School Texts

1. <u>un</u> able	11. <u>pre</u> heat
2. <u>re</u> view	12. <u>inter</u> view
3. <u>in</u> edible (<u>im</u> mobile, <u>il</u> legal, <u>ir</u> responsible)	13. <u>fore</u> warn
4. <u>dis</u> trust	14. <u>de</u> rail
5. <u>en</u> lighten (<u>em</u> power)	15. <u>trans</u> fer
6. <u>nons</u> ense	16. <u>super</u> sonic
7. <u>in</u> side (<u>im</u> plant)	17. <u>semi</u> circle
8. <u>over</u> load	18. <u>anti</u> freeze
9. <u>mis</u> guide	19. <u>mid</u> term
10. <u>sub</u> marine	20. <u>under</u> fed


American Heritage Dictionary © Susan Ebbers 2010 31

Will the Real Prefix Please Stand Up?

reheat	prefix re-	not prefix
red	reheat	red
return		
read		
rebuild		
rewind		
rendition		
reciprocity		
refer		

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Peel Away the Affixes



many face

The diamond was **multifaceted**; it had many faces or sides.

See Report of National Rdg Panel, NICHD, 2000

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The Powerful Prefix!



interior
exterior
posterior
anterior
ulterior
deteriorate

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The Peripatetic Prefix


gress: Latin root "to step"

pro (forward)	progress	step forward
re (back, again)	regress	step back
con (with, together)	congress	step together
di (away from)	digress	step away
trans (across)	transgress	step across
e (out)	egress	step out

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Word Savvy Students Master Morphologically Complex Words

About 60% of the word meanings in printed school English in grades 3-9 might be inferred through knowledge of their morphemes, applied to context clues (Nagy & Anderson, 1984)



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Outside-In Strategy (Ebbers & Denton, 2008)

1. Look **outside** the word at context clues.
2. Look **inside** the word for meaningful word parts.
3. Combine the clues. Use the analogy strategy.



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Outside-In Strategy

pneumonoultramicroscopicsilicovolcanoconiosis

1. Look **outside** the word at context clues, visuals
In the coal mine, the air felt stifled and dusty. The miners coughed, suffering from pneumonoultramicroscopicsilicovolcanoconiosis. Many of them died.
2. Look **inside** the word for known word parts:
pneumono ultra microscopic silico volcano conio isis
3. Use the analogy strategy: *"I don't know this sickness, but I know pneumonia and I know volcano, so by analogy, this sickness might have something to do with lungs and heat—maybe they are inflamed."*

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Word-Savvy Students are Strategists

This student feels confident and capable when confronted by unknown vocabulary.

I think I can, I think I can...



"A moose is known for its unpredictability. It's best to stay on your guard around them!" David warned Jose.

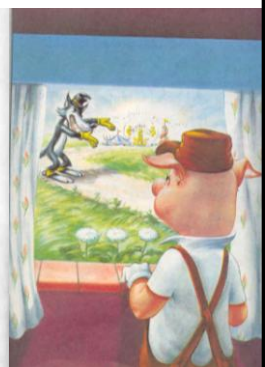
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The wolf was very angry, but he still pretended not to be.

He went to the little pig's house and knocked on the door. "Little pig," he said, "if you will be ready at four o'clock this afternoon, I will take you to the fair. We will have some fun on the swings and roundabouts."

"Very well," said the little pig.



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Morphemic Analysis in Context

(source: Mountain, 2005)

Here's a new word in our story: **tripod**. It says, "He put the camera on the tripod." I wonder what a tripod could be?

Let's say the word again, syllable by syllable, and look for a meaningful part: **tri-pod**

Have you heard *tri* before—in *triangle*, *tricycle*, *triceratops*?

How many sides on a triangle? **Three.**

How many wheels on a tricycle? **Three.**

How many horns on the dinosaur triceratops? **Three.**

Do you think a tripod might have **three** of something? Three what?

What does the story say about the tripod?

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Wysocki & Jenkins: Noteworthy Findings

- Some middle school students did not make use of context clues or morpheme clues
- Those who did access context clues tended to look only in the proximal sentence, and only for synonyms
- Those who could utilize both types of clues did not necessarily use them both in tandem

— (Wysocki & Jenkins, 1987)

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Common Kinds of Context Clues

- A definition, usually offset by commas or dashes (an appositive)
 - A balloonist, the pilot of a hot air balloon, avoids sultry days.
- A synonym or a rephrasing
 - It was sultry, very hot and humid indeed.
- An antonym
 - The weather was sultry, not cool and crisp.
- An example
 - The day was sultry; it felt like a bathroom after a hot shower.
- Generally helpful context
 - It was a sultry day. The day was very hot and humid. If you moved at all, you would break out in a sweat. It was one of those days to drink water and stay in the shade. (from Baumann et al., 2007, p. 117)
- Common signal words
 - which is, in other words, also known as, also called, that is, or, for example, such as

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Point Out Punctuation Clues

Commas
We must find the terminus, or the end, of this circuit.

Dashes
Can photons—particles of light—travel faster than sound?

Parentheses
His lorikeets (parrots) wakened the household.

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Source: *Bringing Words to Life* (Beck, McKeown, & Kucan, 2002)

a. Misdirective Context

Sandra had won the dance contest, and the audience’s cheers brought her to the stage for an encore. “Every step she takes is so perfect and graceful,” Ginny said **grudgingly** as she watched Sandra dance.

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Leo Lionni Alexander and the Wind-Up Mouse

For days and days Alexander searched the garden for a purple pebble. In vain. He found yellow pebbles and blue pebbles and green pebbles—but not one tiny purple pebble.

At last, tired and hungry, he returned to the house. In a corner of the pantry he saw a box full of old toys, and there, between blocks and broken dolls, was Willy. “What happened?” said Alexander, surprised.

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Source: *Bringing Words to Life* (Beck, McKeown, & Kucan, 2002)

b. Nondirective Context

Dan heard the door open and wondered who had arrived. He couldn’t make out the voices. Then he recognized the **lumbering** footsteps on the stairs and knew it was Aunt Grace.

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Source: *Bringing Words to Life* (Beck, McKeown, & Kucan, 2002)

c. General Context

Joe and Stan arrived at the party at 7:00 o’clock. By 9:30, the evening seemed to **drag** for Stan. But Joe really seemed to be having a **good time** at the party. “I wish I could be as **gregarious** as he is,” thought Stan.

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Source: *Bringing Words to Life* (Beck, McKeown, & Kucan, 2002)

d. Directive Context

(circle the context clues)

When the cat pounced on the dog, he leapt up, yelping, and knocked down a shelf of books. The animals ran past Wendy, tripping her. She cried out and fell to the floor. As the noise and confusion mounted, Mother hollered upstairs, "What's all that commotion?"

a. Misdirective
b. Nondirective
c. General
d. Directive

Context Continuum →

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d. Directive Context

When the cat pounced on the dog, he leapt up, yelping, and knocked down a shelf of books. The animals ran past Wendy, tripping her. She cried out and fell to the floor. As the noise and confusion mounted, Mother hollered upstairs, "What's all that commotion?"

com + motion >> with motion

Adapted from *Bringing Words to Life* (Beck, McKeown, & Kucan, 2002)

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When a hot-air or gas balloon surged aloft it could only float where the wind blew it. By rising or sinking the balloon, the pilot looked for a certain kind of wind. When the pilot found that wind, it was smooth sailing ahead!

Source: Virginia Arnold *Another Way to Fly*

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Paul Revere's Ride by Henry Wadsworth Longfellow

Listen my children and you shall hear
Of the midnight ride of Paul Revere...

He said to his friend, "If the British march
By land or sea from the town to-night,
Hang a lantern aloft in the belfry arch
Of the North Church tower as a signal light--
One if by land, and two if by sea;
And I on the opposite shore will be,
Ready to ride and spread the alarm
Through every Middlesex village and farm,
For the country folk to be up and to arm."

(His friend) climbed the tower of the Old North Church,
By the wooden stairs, with stealthy tread,
To the belfry chamber overhead,
And startled the pigeons from their perch...

Houghton Mifflin Science

Home » Cricket Connections » Grade 6, Unit B, Chapter 5

The Soil...It's Alive!

by Margaret A. Hill

How do desert plants survive baking heat and constant drought? With the help of cryptobiotic friends!

Cryptobiotic? It sounds like something out of a graveyard horror movie. Actually, the word means "hidden life" (from the Greek words **kruptos** and **biotikos**). Invisible to the casual observer, dense mats of cryptobiotic organisms, including cyanobacteria, lichens, mosses, green algae, and microfungi, mix with sand and clay to form a life-sustaining soil in desert regions. Without it, a lot of desert plants wouldn't survive.

http://www.eduplace.com/kids/hmsc/6/b/cricket/ckctcontent_6b5.shtml

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MA Text as a Proving Method

Said the cunning Spider to the Fly, "Dear friend, what can I do,
To prove the warm affection I've always felt for you?
I have within my pantry, good store of all that's nice:
I'm sure you're very welcome—will you please to take a slice?"

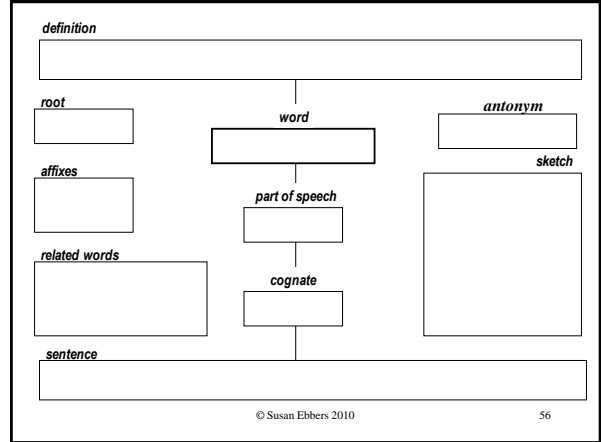
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The Strategy of Analogy

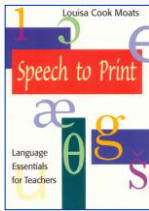
Think Aloud:

I don't know what *biosphere* means but I do know that *atmosphere* and *hemisphere* have to do with earth which is a sphere and I do know that a *biography* is the story of someone's life, so...along with the context clues, I think maybe *biosphere* might be a specific place on earth where specific life exists.

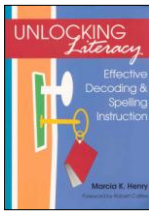
(Anita Archer on Content Reading)



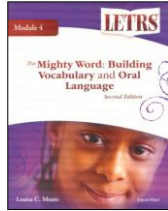
Professional Morphology Guides



Moats, 2000



Henry, 2010
new 2nd edition



Moats, 2009
LETRS Module 4

Reader Friendly Research on MA + Text

- See Baumann, Edwards, Boland, & Olejnik, 2003
– *Vocabulary Tricks...*
- See Edwards, Font, Baumann, & Boland, 2004
– *Unlocking Word Meanings*
- See Baumann, Ware, & Edwards, 2007
– *Bumping into Spicy, Tasty Words....*
- See Ebbers & Denton, 2008
– *A Root Awakening...*
- See examples on my blog [Vocabulogic](#)

Thesis: Persistence Vocabulary is a Growth Construct



Slowly the bucket fills,
through many encounters
with the word or
morpheme in varying
context over time

**“There is a mountain of evidence
suggesting that spacing study time
leads to better memory of the material”**

Daniel Willingham, 2002

Caution



- Memorizing weekly word lists, with minimal interaction with the word in speech and print, is not effective, esp. if the student has learning difficulties
 - (Bos & Anders, 1990; Bryant et al., 2003; Jitendra et al., 2004)
- Using the dictionary as primary word-learning method is not effective
 - (Bos & Anders, 1990; Bryant et al., 2003; Jitendra et al., 2004; Nagy, 2007)
- Vocabulary lists that are based on phonics or spelling patterns does not optimize the opportunity to learn meaning

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Closing Thoughts

- Model a habit of enquiry; kindle interest in words
- Build networks of related words, seek associations
- Teach most common morphemes
- Teach how to use context clues
- Model the strategy again and again...
- Teach how and when to use other strategies (dictionary, thesaurus, analogy)
- Provide distributed review

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