

## Understanding Academic Vocabulary

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## Thesis: Persistence Vocabulary is a Growth Construct



### Detecting Mad Cow Disease

By Stanley B. Prusiner Scientific American July 2004

Last December mad cow disease made its U.S. debut when federal officials announced that a holstein from Mabton, Washington had been stricken with what is formally known as bovine spongiform encephalopathy (BSE). The news kept scientists, government officials, the cattle industry and the media scrambling for information well past New Year's. Yet the discovery of the sick animal came as no surprise to many of us who study mad cow disease and related fatal disorders that devastate the brain. The strange nature of the prion--the pathogen at the root of these conditions--made us realize long ago that controlling these illnesses and ensuring the safety of the food supply would be difficult.

canine, porcine,  
feline

Poor comprehension outcomes in middle school are frequently due to limited vocabulary, including knowledge of academic words

(e.g., August & Shanahan, 2006; Buly & Valencia, 2003; Carlo, 2005; Stahl & Nagy, 2006; Stanovich, 1986)

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### Word Knowledge ➡ Comprehension

Reading with comprehension depends on understanding at least 95% of the words

(Carver, 1994; Hu & Nation, 2000)

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### Interest Wanes if Text is Incomprehensible



Interest is more likely to engage if the task is appraised as challenging but not too difficult, within reach but not a cakewalk. Instruction offsets the negative influence of low self-efficacy

(Hidi & Ainley, 2008; Silvia, 2003; Willingham, 2009)

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**"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)

### **We Cannot Rely on Context**

- Nagy, Anderson, and Herman (1987) estimated a probability of only 5%
- Nagy, Herman, and Anderson (1985) found an 11% probability

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### **We Cannot Rely on Educational Videos**

- Educational media may help students develop interest in a given topic
- But they have little effect on knowledge structures, vocabulary, and comprehension of related texts
- (Adams, 2009; Bus, de Jong, & Verhallen, 2008; Echols, West, Stanovich, & Zehr, 1996)

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### **What Not To Do**

- Memorizing word lists
- Teaching words without context, or usage
- Using dictionaries to teach meanings
  - Instead, use student-friendly definitions
    - Generated by teacher and/or students
    - Some student-friendly dictionaries:
      - Longman Publishing House
      - Collins Cobuild Dictionary

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**Using the dictionary to learn words is not effective.  
Copying word lists to learn meanings is not effective.**

(Bos & Anders, 1990; Bryant et al., 2003; Jitendra et al., 2004; Nagy, 2007, etc.)

### **Four Suggestions**

Build topic knowledge, interest (Adams, 2009)

Verbally, substitute known words with academic words

Promote morphological awareness and word consciousness

Teach and review word meanings with persistence

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## Topic Knowledge ~ Topic Vocabulary

**Build knowledge around a given topic—the associated words will tag along.**

**Bonus:** Knowledge triggers interest. Interest prompts persistence and promotes deeper processing

(Ainley et al., 2002; Kintsch, 1998; Thorndike, 1906).

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## Optimize Oral Language

- Provide adolescents with instruction that includes discussion of text and concepts (Torgesen et al., 2007)
- Oral discussion of content and content vocabulary is a common component of many successful reading interventions (Nagy, 2007)

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## Ways to Improve Adolescent Literacy

Source: Florida Center for Reading Research; Torgesen, August 2006

1. More explicit instruction and guided practice in the use of reading comprehension strategies
2. Increasing the amount of discussion of content in texts
3. Maintain high standards for the level of conversation, questions, vocabulary used in discussions and assignments
4. Adopt instructional methods that increase student engagement with text and motivate students to read
5. Teach content material in powerfully explicit and cognitively engaging ways, providing review over time

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## Invest Time in Academic Vocabulary

- Is the word frequently used across subject areas?
  - *plot, positive, revolution*
- Is it widely related (large root family)?
  - *civil, civilian, civility, uncivil, civilize, civilization, etc.*

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## Words for Academic Success

- Academic words
- Used primarily in school texts or other formal settings
  - Students from disadvantaged backgrounds are less likely to hear this language at home
    - low SES
    - non-English (or non standard English speaking)
    - less exposure to those with post-secondary education

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School of Linguistics & Applied Language Studies  
**THE ACADEMIC WORD LIST**  
Averil Coxhead  
Sublist 1 of the Academic Word List - Most Frequent Words in Families  
[www.victoria.ac.nz/lals/staff/averil-coxhead/awl/](http://www.victoria.ac.nz/lals/staff/averil-coxhead/awl/)

<i>analysis</i>	<i>method</i>
<i>approach</i>	<i>occur</i>
<i>area</i>	<i>percent</i>
<i>assessment</i>	<i>period</i>
<i>assume</i>	<i>policy</i>
<i>authority</i>	<i>principle</i>
<i>available</i>	<i>procedure</i>
<i>benefit</i>	<i>process</i>
<i>concept</i>	<i>required</i>
<i>consistent</i>	<i>research</i>
<i>constitutional</i>	<i>response</i>
<i>context</i>	<i>role</i>
<i>contract</i>	◉: <i>section</i>

note the "task words" (words used in directions)

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**“Nearly half of incoming freshmen cannot read their textbooks fluently”**

(Carnegie Corporation, 2002)

**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)

The greatest benefit from instructional time spent on word study can be gained from exploring roots, prefixes, suffixes, and networks of related words.

--Henry, 1997

## Word-Savvy Students Are Morphologically Aware

Morphological Awareness (MA)

- The ability and aptitude to use knowledge of prefixes, suffixes, roots, and bases to gain word knowledge
- Also called structural analysis

## 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**

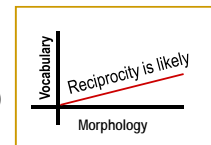
## Word-Savvy Students Tuned in, Turned on, and Word Conscious!

**“...vocabulary instruction needs to be more explicitly metalinguistic—that is, word consciousness is an obligatory, not an optional, component”**

Nagy, 2007, p. 54

## MA Increasingly Influences Word Knowledge

- When controlling for:
  - age, word identification, phonological processing, etc.
  - MA accounts for vocabulary variance among students in:
    - Kindergarten: 8%
    - 2<sup>nd</sup> grade: 15%
      - McBride-Chang et al., 2005
    - 5<sup>th</sup> grade: 50% (didn’t control for PA)
      - Carlisle, 2000



## MA & Reading

- By fifth grade, MA predicts reading better than PA
  - Mann and Singson, 2003
- MA made a significant and unique contribution to reading comprehension in grades 4-9
  - Nagy, Berninger, & Abbott, 2006

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## Word-Savvy Students Grasp Derivations

base words	boy, farm, cold
inflections	boys, farmed, farming, colder, coldest
compound words	boyfriend, farmhouse, coldhearted
derivations syntax shift	boyish, boyishly, boyhood, farmer, Farmington, farmstead

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

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## Those Dratted Derivations!

### Which Transformations Are More Complex?

- no shift in orthography or phonology
  - (e.g., growth to grow; childish to child; computer to compute)
- orthographic shift but no phonological shift
  - (e.g., famous to fame; creative to create)
- phonological shift but no orthographic shift
  - (e.g., courageous to courage; adaptation to adapt)
- both a phonological and an orthographic shift
  - (e.g., width to wide; pleasure to please, evolution to evolve)

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## Anglin, 1993

Interview with fifth grader, verbal, no pictures (p. 100)

What does the word **treelet** mean?

*OK. Maybe it means like a tree and maybe like for Christmas you can put lights on it...*

Can you tell me anything more about treelet?

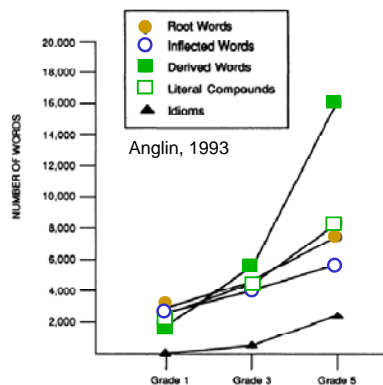
*Is it spelled -let or -lit?*

Actually, it's l-e-t.

*I'm not sure about this, but it might mean a baby tree...*

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## Troublesome Derivations: The Best Indicator of Academic Text And Most Ubiquitous to Science

Butler et al., 2004, p. 48 (a 5<sup>th</sup> grade text analysis)

Table 13

Proportion of Low Frequency Word, 3-or-More-Syllable-Word, and Derived Word Types Identified as Academic Word Types by Subject

Subject	Low freq.	3-or-more-syllables	Derived
Math	.20	.34	.33
Science	.61	.52	.81
Social Studies	.58	.54	.64

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## Word-Savvy Students Recognize Morphological Families

Upper elementary students generally read words more quickly and accurately if they belonged to large morphological families (e.g., *tract, tractor, traction, subtract, retract, detract, extract, protractor*)

–facilitated by semantic and phonological transparency and by reading proficiency

(Carlisle and Katz; 2006; see also Bertram, Baayen, & Schreuder, 2000; Nagy, Anderson, Schommer, Scott, & Stallman, 1989)

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lemon drop  
gum drop  
teardrop

eye dropper  
eye droppers  
dropper

droplet  
droplets

dropkick

drop in for a visit

drop drops  
dropping  
dropped

just "drop by"

drop

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## Networking a Morphological Family

sign	signal	signal light	cosign
signify	signature	significant	insignificant
signage	insignia	signpost	signet ring
sign in	sign off	sign up	sign language
signs of the times		give me a sign	

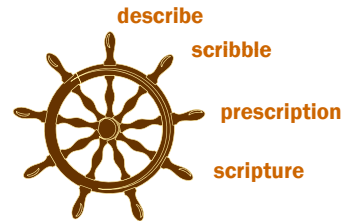
**sign:** from Latin *signum*, meaning "to mark, to show"

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## Networks, Webs, Diagrams

Create networks of related words. Make a word wheel for the Latin root *scrib*, meaning *to write*.



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grammar school  
grammar books  
rules of grammar  
grammatical  
grammatically  
ungrammatical  
ungrammatically  
grammatology

**gram, graph  
to write,  
written**  
Greek

grammar

telegraph  
mammogram  
histogram  
anagram  
cryptogram  
monogram  
electrocardiogram

gram

graph  
grapheme  
graphologist  
graphically

photographer  
cartographer  
geographer  
cryptographer  
autobiographer  
xylographer  
paleographer  
biographer

photograph  
polygraph  
mimeograph  
phonograph  
telegraph  
paragraph

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## Word-Savvy Students Form Networks Through Morphological Families

**terra** (Latin for 'earth')

- territory
- Mediterranean Sea
- terracotta pots, terracotta tiles
- extraterrestrial exploration
- rough terrain
- subterranean excavation
- territorial or possessive behaviors
- *terra firma*
- *Tara* ?? (*Gone with the Wind*)

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## Linking the Curriculum Via Morphological Families

**astro: Greek for stars, heavens**

aster (flower)  
asterisk  
astronomer  
astrology  
astrobiology  
astrophysics  
**disaster ???**

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## Word-Savvy Students are Fearless

Including such [morphological] ideas in discussions of words lets students see language as an open book rather than as mysterious and impenetrable with authority over them...

Beck, McKeown, & Kucan, 2002, p. 128

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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 (along with context clues)

(Nagy & Anderson, 1984)

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## Word-Savvy Students are Strategists

**context + morphemes = meaning**

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

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

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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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## Outside-In Strategy

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."*

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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#### infer word meanings by analogy

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...

*Paul  
Revere's  
Ride*  
Henry  
Wadsworth  
Longfellow

### Word-Savvy Students Understand the English Language

(and realize that most words are not rule-breakers)

German, Latin, French, and Greek

### The English Language



■	Latin
■	French
■	Germanic
■	Greek
■	Other

Estimates from a computerized survey of about 80,000 words in the old *Shorter Oxford Dictionary* (3rd ed.), published in *Ordered Profusion*, Finkenstaedt & Wolff (1973)

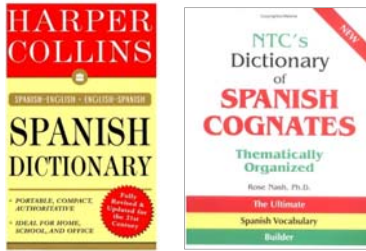
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### Support for Language Learners

Goldenberg, 2006, Education Week, 25(43)

1. Strategic use of the primary language
2. Predictable, clear, consistent instructions and routines
3. Redundant information (visuals, physical gestures, etc.)
4. Focus on the similarities (i.e. cognates) and differences between English and the native language
5. Identify and clarify difficult words and passages
6. Consolidate text knowledge through summarization
7. Provide extra practice in reading words, sentences, and stories
8. Target vocabulary and check comprehension frequently
9. Paraphrase students' remarks and encourage expansion
10. Build on students' knowledge in their native languages



Teachers and students benefit from resources for accessing the cognate (e.g., Spanish)

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## Common Spanish & Academic English

(Bravo, Hiebert, & Pearson, 2007)

Latin root	Common Spanish	Academic English	Common English
arbor	árbol	arbor, arboretum	tree
avis	ave	avian, aviary, aviation	
primus	primero	prime, primary, primer	
luna	luna	lunar, lunacy, lunatic	
necessitas	necesitar	necessity, necessary	

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## Cognates, Morphology & Academic English An ELL and EO Study in Fifth Grade

"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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When students are aware of Spanish-English cognates, they resolve vocabulary tasks more effectively.

Nagy, Garcia, Durgunoglu, & Hancin-Bhatt, 1993

## Uncover and Discuss False Cognates!

**insect/insecto, observe/observar**

**Most Spanish words that end in *-ción* can be translated into English by changing the suffix to *-tion*"**

–*constitución* means "constitution"

–*nación* means "nation"

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## Specific Word Instruction

- Cognitively engaging and meaningful
- Student-friendly definition
- Examples and non-examples
- Peer discussions using key vocabulary
- Multiple exposures over time
- Multiple venues: Hear, say, read, write
- Reinforced through graphic organizers
  - Semantic mapping and sorting

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English language learners benefit from instruction that shows how words can be grouped together in meaningful ways, including synonyms, antonyms, and word family associations.

(Echevarria, Vogt, & Short, 2004; Gorgnet et al., 2000)

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## Interactive Semantic Sorting

- Use relevant vocabulary
- Sort word cards with a peer
- Defend or justify word placement
- Debate options
- Not a right/wrong proposition

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## Semantic Feature Analysis

Teach "How To" with Known Words

Partners discuss answers and justify responses. Verbalize it!

	mammal	reptile	bird
hare			
asp			
vulture			
coyote			
owl			
chameleon			

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**Warning:**

**Graphic Organizers à la Mode!**

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## Semantic Feature Analysis

Adolescents with Learning Disability

"Systematic discussion utilizing student background knowledge and text information may be particularly fruitful in terms of generating long-term learning"

(Bos & Anders, 1990, p. 40)

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## Word Relationships

Partners discuss answers and justify responses

	nearly the same	nearly the opposite	belong together	not related
homage-respect				
fealty-loyalty				
serf-lord				
moat-tower				
knight-tapestry				
knight-night				
crusade-crusader				

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**Keep Words and Morphemes in Use**

**Review Revisit Remember**

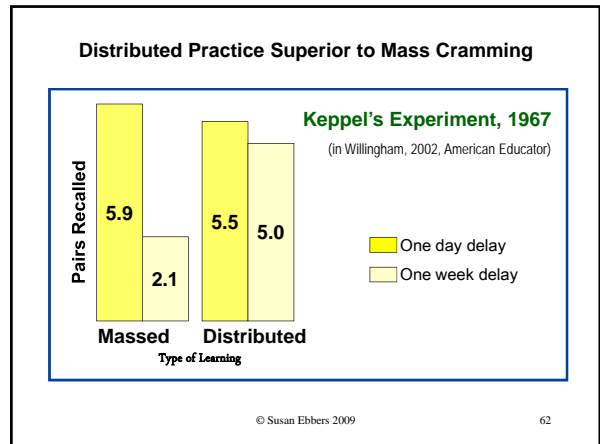
**Distribute the Practice over Time**

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

Daniel Willingham, 2002

Cramming is counterproductive

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### To Retain New Vocabulary, Learners Need Multiple Distributed Exposures, in Context

- at least 6 exposures
  - Jenkins, Stein, & Wysocki, 1984
- 12 exposures
  - McKeown, Beck, Omanson, & Pople, 1985
- 20 exposures
  - Beck & McKeown (2004)
    - Some of the primary-grade students still did not learn all the new words
- this varies
  - By word and learner characteristics

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### Professional Morphology Guides

**Moats, 2000**

**Henry, 2003**

**Moats, 2009  
LETRS Module 4**

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### Professional Vocabulary Guides

- Bringing Words to Life
  - Beck, McKeown, & Kucan, 2002
- The Vocabulary Book
  - Graves, 2006

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### Awareness of “Plain” and “Fancy” Words

- Fancy Nancy series
  - by Jane O’Connor
  - learn new words
  - develop synonym selectivity, nuance
  - grades K-4, depending on how it’s used

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## Lemony Snicket Inserts Definitions Into His Narratives

Example: *A Series of Unfortunate Events; The Carnivorous Carnival*

But I always insist that the most frightening part of any beast is its belly, for the simple reason that if you are seeing the belly of the beast it means you have already seen the teeth of the beast and the claws of the beast and even the hair of the beast, and now you are trapped and there is probably no hope for you. For this reason, the phrase “in the belly of the beast” has become an expression which means “inside some terrible place with little chance of escaping safely,” and it is not an expression one should look forward to using.

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### Sopris West Publications:

- Vocabulary Through Morphemes: Suffixes, Prefixes, and Roots for Intermediate Grades
- Power Readers (consumable interactive decodables with pre-reading and post-reading material)
- Supercharged Readers: Decodable chapter books with strong vocabulary component
- Daily Oral Vocabulary Exercises: A Program to Expand Academic Language in Grades 4-12

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