

**po ly syl lab ic**

# **Critical Factors in Polysyllabic Word Reading: Roles of Letters, Sounds, and Meanings**

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**pa li sɪ læb ɪk**

# Overview

- What are polysyllabic words and why do they matter?
- What about polysyllabic words makes them hard to read?
- What makes some children struggle with these words?
- What strategies are frequently taught?
  - What does evidence suggest?
  - What do we recommend you do?

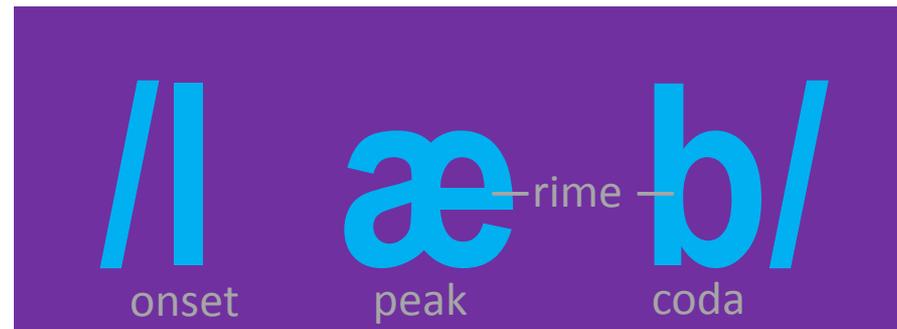
What are polysyllabic words and  
why do they matter?

# Definition of “polysyllabic words”

Contain more than one syllable

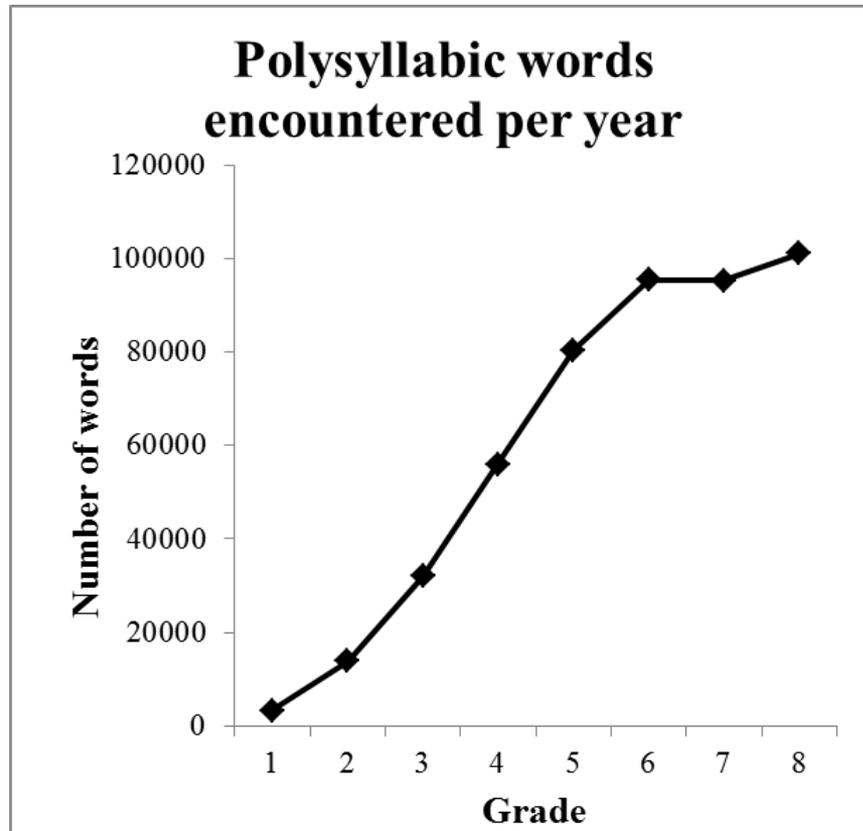


Syllables are defined by *sounds*, not letters



Syllables always have a peak, usually a vowel

# Polysyllabic words become more common in texts in the upper grades



Polysyllabic words occur in a lot of  
content area texts

**aesthetic**

**photosynthesis**

**constitutional**

**polynomial**

What makes polysyllabic words  
hard to read?

# Vowel letters make multiple sounds

minor /aɪ/

hi /aɪ/

hit /ɪ/

raisin / /

i

# Syllable division is complex

in  
minor  
line

ea  
weather  
reality

st  
master  
estate

vcv

wvv

vccv

Wilson Reading System (Wilson, 2005)

Treiman, Bowey, & Bourassa, 2002; Treiman, Mullennix, Bijeljic-Babic, & Richmond-Welty, 1995; Treiman & Zukowski, 1990; Taft, 1979; Taft, 1992

# Stress assignment is hard

**mirripe**

**/'mɜː aɪp/**

**/mɜː 'raɪp/**

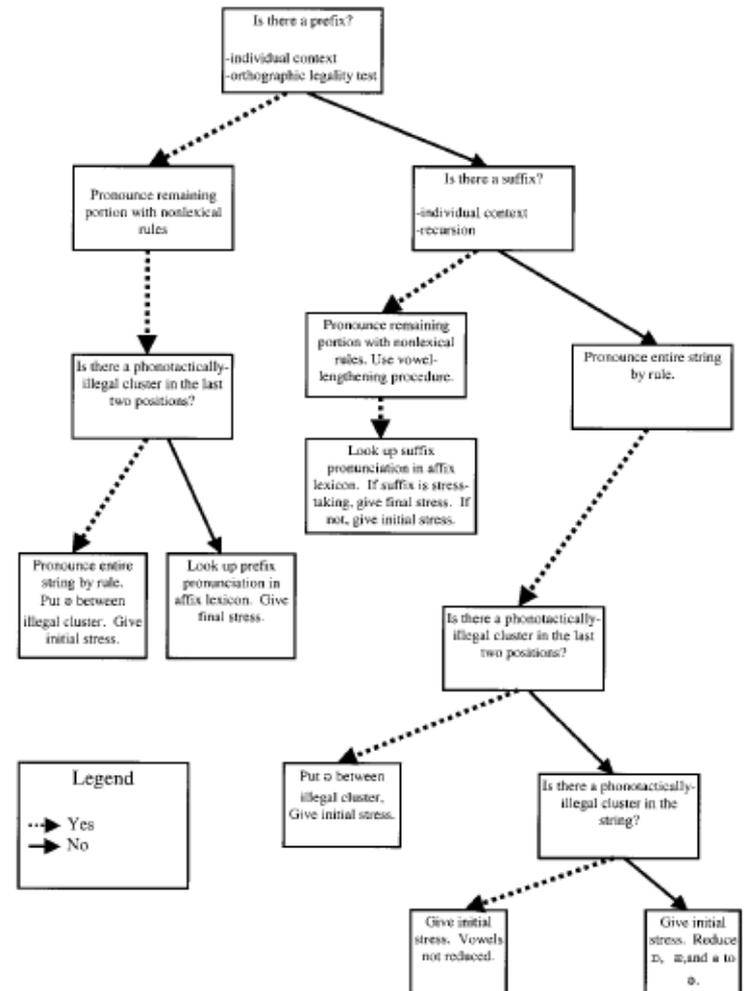


FIG. 2. The set of nonlexical stress rules.

# Children experiencing difficulty with stress assignment

**sufferance**



**swiftness**



# Polysyllabic words are often polymorphemic

**decisions**

**derived word with an inflection**

**Morphological status of English words (Nagy & Anderson, 1984)**

7%	morphologically basic
12%	affixed
17%	compounds/contractions
16%	inflected

**decide**

**root (base) word**

**-sion**

**derivational suffix**

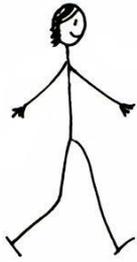
**-s**

**inflection**

What makes some children  
struggle with these words?

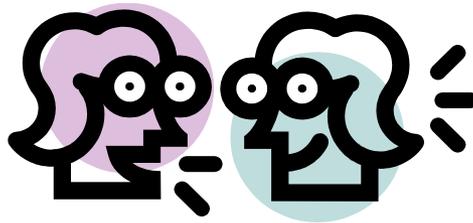
They have weak phonological awareness skills

## Rhyming



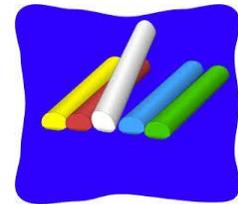
/wɔk/

walk



/tɔk/

talk



/tʃɔk/

chalk

# Segmenting & Blending



/rakit/



/r-a-k-i-t/



/ra-kit/

## Deletion (Elision)

Say *pretend*  
without  
saying *pre*

*tend*

Say *replayed*  
without  
saying /d/

*replay*

They have poor grapheme-phoneme  
correspondence (GPC) knowledge

s = /s/

tion = /ʃən/

They are unable to utilize bigger  
chunks in words

**Syllables**

**pub/lish**

**Morphemes**

**re/move/able**

They have limited vocabulary

tariff

stirrup

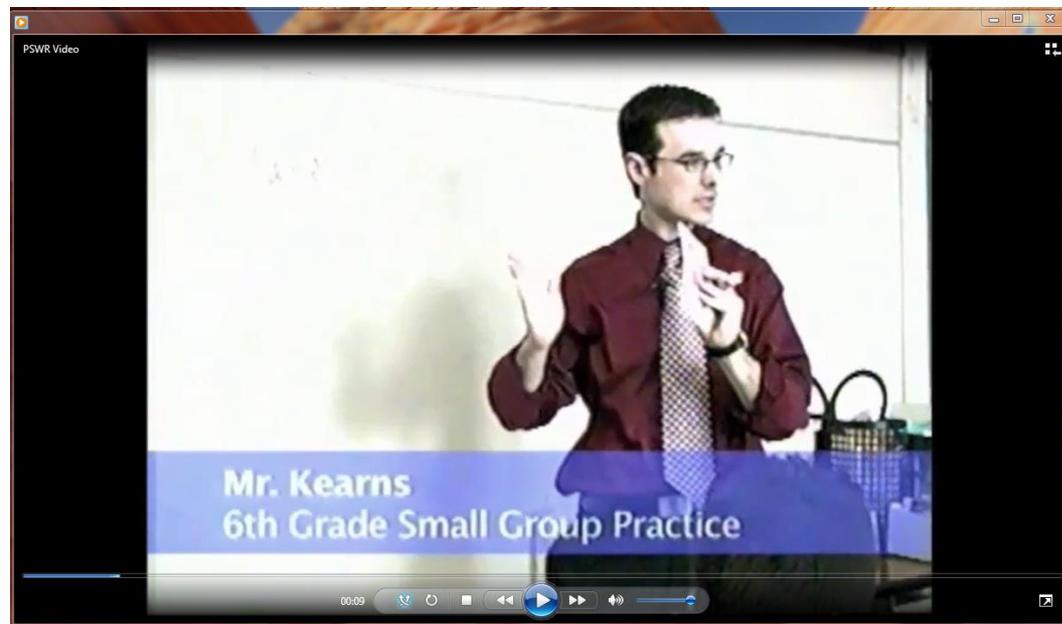
manila



What strategies are frequently taught? Which should be taught?

# Here's a classroom example of some polysyllabic word reading instruction

- This is Devin teaching a group of struggling 6<sup>th</sup> graders to read polysyllabic words
- Notice the strategies being used

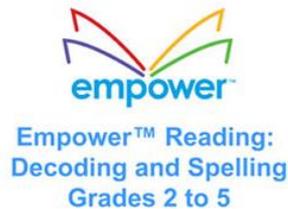


# What did we see in the video?

- Instruction on syllable types
- Phonics blending by syllable
- Breaking words into chunks

# What other strategies are taught in commonly used programs?

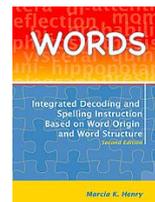
- Emphasizing morphemes
- Teaching flexibility
- Teaching syllable division rules
- Teaching phonological awareness for syllables



PHAST/Empower Reading



Wilson Reading System



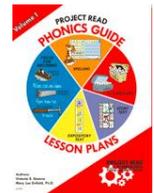
Words by Marcia Henry



Lindamood-Bell Phoneme Sequencing Program



REWARDS



Project READ

# Common strategies taught for reading polysyllabic words

- Instruction on syllable types
- Phonics blending by syllable
- Breaking words into chunks
- Emphasizing morphemes
- Teaching flexibility
- Teaching syllable division rules
- Teaching phonological awareness for syllables



Does evidence support these  
strategies?

# Important note

- We are not endorsing a particular program
- We are sharing these strategies for two reasons:
  1. To help evaluate a program to see if it includes good polysyllabic word reading techniques
  2. To help decide if/how you should supplement a program

# 1. Syllable Types

- Some studies included syllable type instruction and had positive effects
  - Cohen & Brady (2011)
  - Diliberto, Beattie, Flowers, & Algozzine (2009)
  - Shefelbine (1990)
- Other studies have NOT taught syllable types and achieved good effects
  - Lovett, Lacerenza, De Palma, & Frijters (2012)
  - Morris et al. (2012)
  - Shippen, Houchins, Steventon, & Sartor (2005)
  - Vadasy, Sanders, & Peyton (2006)

# Our recommendation: *Maybe* teach *important* syllable types

- Open Syllable

- The vowel comes at the end of the syllable
- The vowel says its “long” sound.

see.

- Closed Syllable

- The vowel comes before the ending or in the middle of the syllable
- The vowel says its “short” sound.

set.

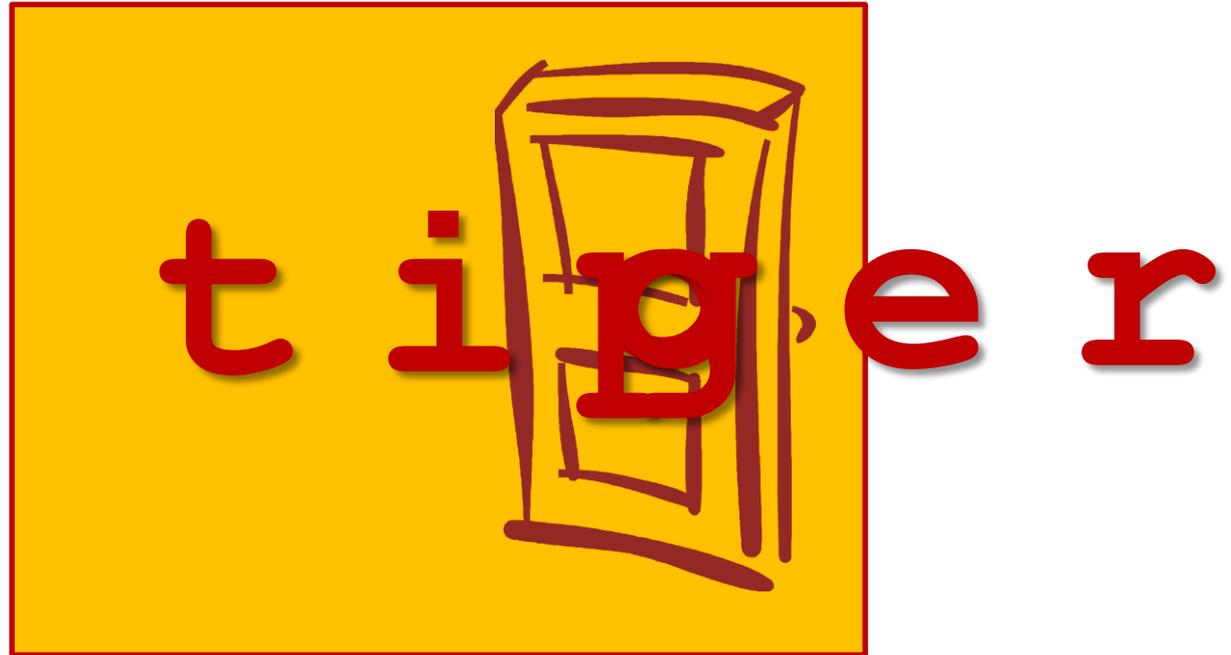
- Consonant-le Syllable

- The syllable has only three letters (consonant + l + e)
- Occurs at only at the end of the word
- The e is silent

rattle.

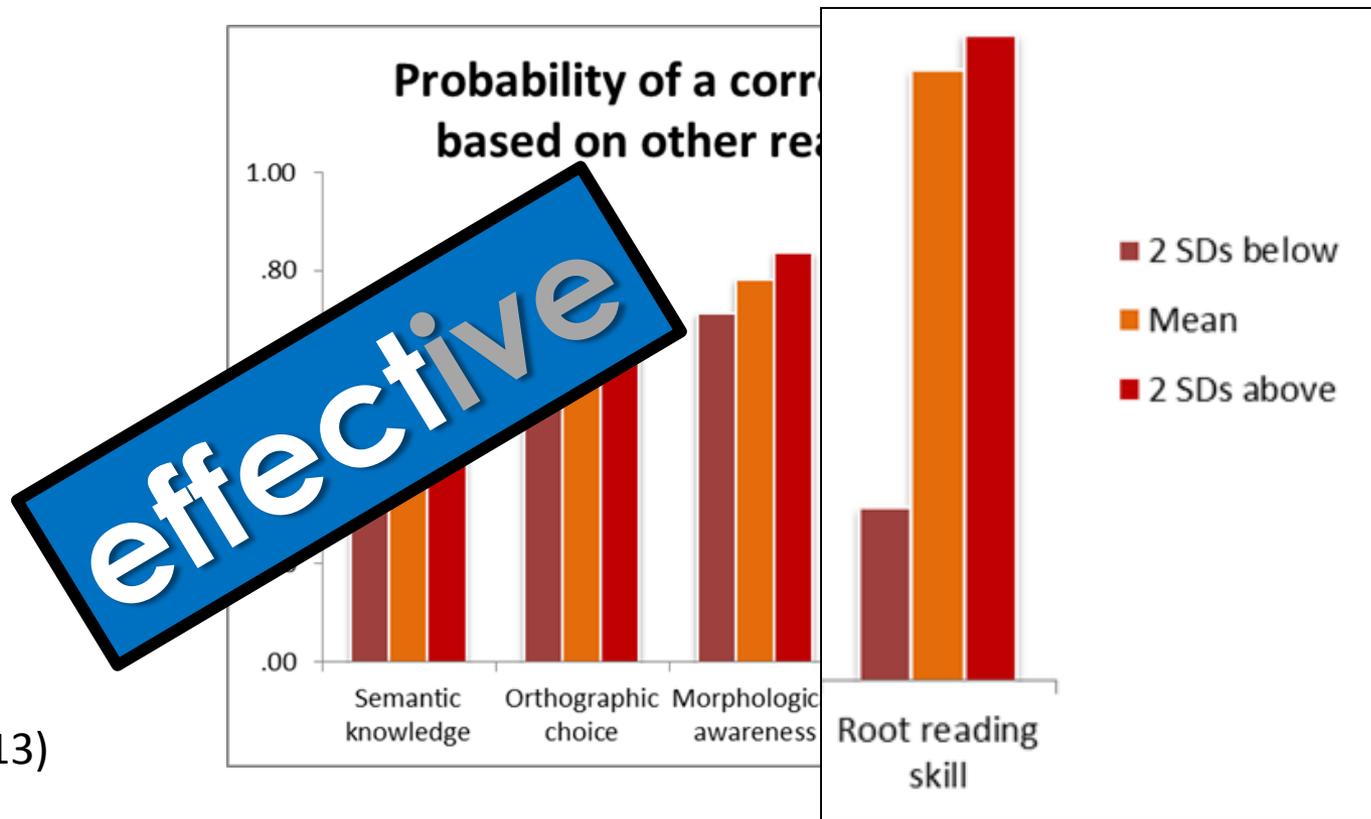
Once you teach these, practice reading them.

But, this probably is *not* a good idea:  
Too “cognitive”



## 2. Phonics blending by syllable

- Our data indicate that when given polysyllabic, polymorphemic words, readers tend to use morphological units



- We also have data showing that children may rely on grapheme-phoneme correspondences (GPCs) units in the absence of morphological units
- They may also try to identify words within the target word



**speedam**

- Most studies we have reviewed include attention to parts of the word besides GPCs

- Syllables
- Affixes
- Roots



### Peeling off tree

“I peel off (affix) at the beginning (or end) of the word. The root is \_\_\_\_\_. The word is \_\_\_\_\_” (p. 468)

Vowel says	-on	-an	-a
i says /u/			
i says /ee/	-ion	-ian	-ia
ti says /sh/	-tion	-tian	-tia
ci says /sh/	-cion	-cian	-cia
si says /zh/ or /sh/	-sion	-sian	-sia
gi says /j/	-gion	-gian	-gia

### Ending grid

- Overt strategy:
1. Circle the prefixes.
  2. Circle the suffixes.
  3. Underline the vowels.
  4. Say the parts of the word.
  5. Say the whole word.
  6. Make it a real word.

EXAMPLE  
reconstruction

### Overt strategy for decoding

# Our recommendations:

- Teach *chunking*
- Teach children *to look for morphemes*

# 3. Chunking

- Some studies suggest that chunking improves reading
  - Bhattacharya & Ehri (2007)
  - Shippens et al. (2005)
  - Wise (1992)
- Our studies show the value, as already described

Chunking  
Card

li



Practice reading high  
frequency syllables

li lin  
re

# Chunking rules

1. Every syllable has a vowel letter in it

describe X

2. Each part has to look OK

describe X

# 4. Teach morphology

- Some studies suggest teaching morphology helps readers

– H **nature** /neɪ tʃə/

– Kennedy & Backman (1993)

– L **nature**

– M **natural** /nætʃərl/

– S

– Vadasy, Sanders, & Peyton (2006)

- Our studies suggest that readers pay attention to morphemes, especially when they are obvious



### Most Common Prefixes

Prefix	Meaning	Key Word
anti-	against	antifreeze
de-	opposite	defrost
dis-*	not, opposite of	disagree
en-, em-	cause to	encode, embrace
fore-	before	forecast
in-, im-	in	infield
in-, im-, il-, ir-*	not	injustice, impossible
inter-	between	interact
mid-	middle	midway
mis-	wrongly	misfire
non-	not	nonsense
over-	over	overlook
pre-	before	prefix
re-*	again	return
semi-	half	semicircle
sub-	under	submarine
super-	above	superstar
trans-	across	transport
un-*	not	unfriendly
under-	under	undersea

\*Most frequent. The four most frequent prefixes account for 97 percent of prefixed words in printed school English.

### Most Common Suffixes

Suffix	Meaning	Key Word
-able, -ible	can be done	comfortable
-al, -ial	having characteristics of	personal
-ed*	past-tense verbs	hopped
-en	made of	wooden
-er	comparative	higher
-er,	one who	worker, actor
-est	comparative	biggest
-ful	full of	careful
-ic	having characteristics of	linguistic
-ing*	verb form/ present participle	running
-ion, -ion, -ation, -ition	act, process	occasion, attraction
-ity, -ty	state of	infinity
-ive, -ative, -itive	adjective form of a noun	plaintive
-less	without	fearless
-ly*	characteristic of	quickly
-ment	action or process	enjoyment
-ness	state of, condition of	kindness
-ous, -eous, -ious	possessing the qualities of	joyous
-s, -es*	more than one	books, boxes
-y	characterized by	happy

\*Most frequent. The four most frequent suffixes account for 97 percent of suffixed words in printed school English.

pre-  
-tion -tive

Practice with flash cards

# Teach *morphological* word families

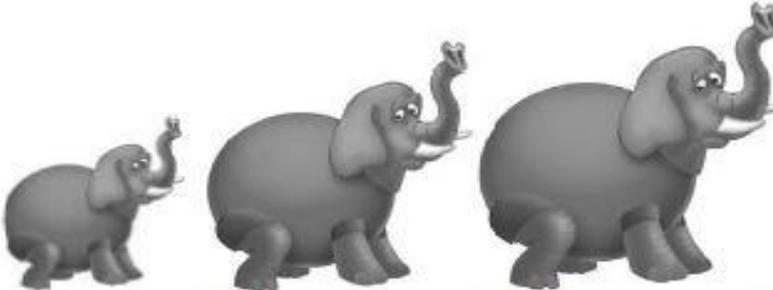
**Ender Benders**

When you add Ender Benders to the ends of words, they bend the meanings of words a little.



rock **ed**    rock **ing**

rock **y**



**big**    **bigger**    **biggest**

# Word family for *nature*

supernaturally  
preternaturally  
naturalists  
naturalizes

naturalism  
naturalist  
naturalistic  
naturalization

Teach words families in groups

- Teach a variety of these words
- Teach words that are likely known
- 

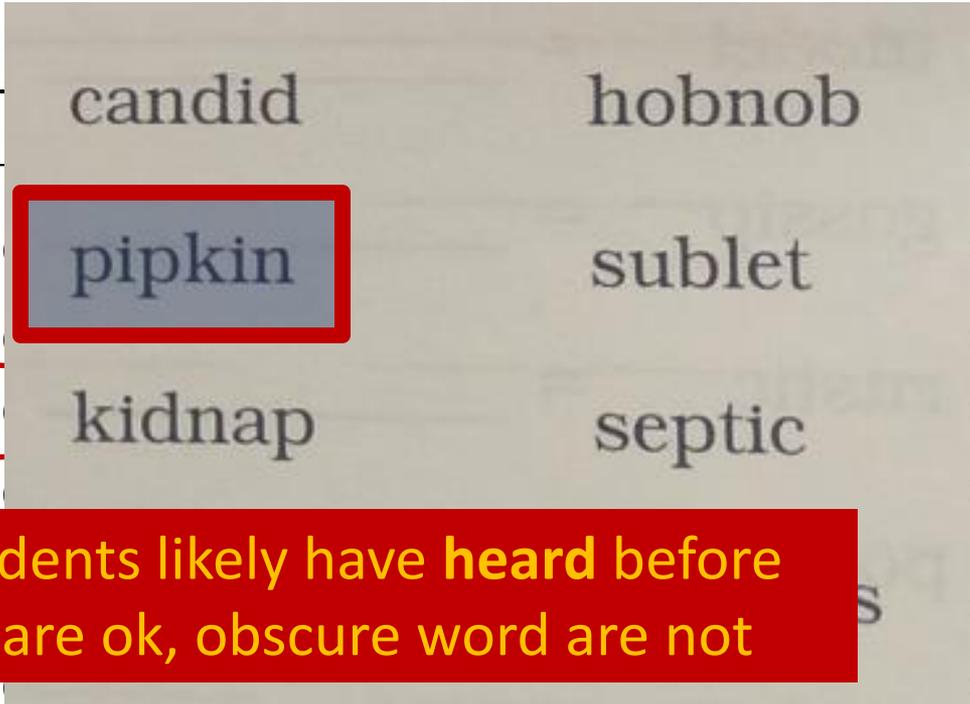
unnaturalness  
**supernatural**  
supernaturalism  
preternatural  
**natural**

natured  
**natures**  
**nature's**  
denatured

# Importance of words children know

Table 1.  
Different Polysyllabic Word Reading Programs and the Words Used

Program	Activity	Number of words	Freq	emes
Patterns for Success in Reading and Spelling REWARDS	Divide words using vc/vc rule and read words	32	47.92	0.42
	Underlining vowels	15	45.58	0.50
	Circling prefixes and suffixes	21	42.59	0.60
	Multistep strategy instruction and practice	18	46.79	0.46
Wilson Reading System	Con...			0.42
	into			
	Con...			0.31
	into multisyllabic words	20	42.86	
Words Their Way with Struggling Readers	Sort words by type	16	54.55 (6.16)	5 59.56 (63.80) 5.44 (0.73) 4.81 (0.91) 2.00 (0.00) 1.25 (0.45)



Use words that students likely have heard before  
Uncommon words are ok, obscure word are not

If you use less common words, introduce them ahead of time so students have some exposure

Note: REWARDS = Reading Ex

# Evidence for using vocabulary children know

- In multiple studies, we have seen that children's vocabulary knowledge related strongly to their polysyllabic word reading ability
  - Kearns (2013)
  - Kearns, Steacy, Compton, Gilbert, and Goodwin (in preparation)
  - Goodwin, Gilbert, Cho, & Kearns (2014)

# How much emphasis on meaning?

trans = across

transport = carry across?

port = carry

Focus on root *words*, not roots that cannot stand alone, and use words that are in children's vocabularies

# Focus on the root?

interrupt

Maybe ... “rupt” will not help with meaning very much, but it’s a useful syllable

repair

Probably ... “pair” is very common, but it does not link to the word “repair” very well

expla[i]nation

Yes ... “explain” has a sizeable word family and the change needs practice

scien[ce]tist

Yes ... “science” also has a sizeable word family and the change also needs practice

visualize

Probably not ... “vis” is a simple syllable, and it only helps a little with meanings (but it does help)

# 5. Emphasize flexibility

- Multiple studies have shown that a flexible strategy results in achievement gains
  - Bhattacharya & Ehri (2004)
  - Lovett et al. (2000, 2008)
  - Morris et al. (2012)
  - Shippen et al. (2005)
- We have shown that children's ability to recognize nonwords is linked to their ability to determine what word we were "trying to say"

# What are these words?



break-fast

moth-er

kit /kɪt/ /k<sup>h</sup>ɪɾ/

kitten

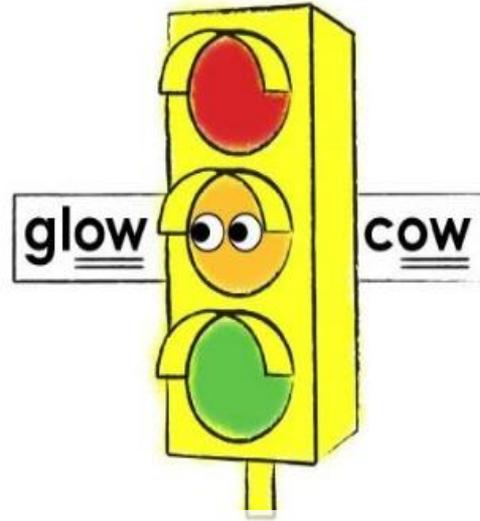
ten /tɛn/ /n̩/

# So... emphasize flexibility

- “Turn the word like the radio dial to make it come in better”
- “Tune it like **Watch Ms. Ish**  
pronunciation **do this** better.”



# Another way to emphasize flexibility



## Vowel alert

“First, I will try */first pronunciation/*, then I will try */second pronunciation/*, and see which gives me a real word” (Lovett et al., 2000, p. 469)

## 6. Teach syllable division

- Only one study showed a positive effect for a program including syllable division
  - Diliberto et al. (2009)
- Another study did not show an effect
  - Canney & Schreiner (1976)
- We have not studied this directly

# In theory, why might teaching syllable division be a bad idea?

- Word reading should be very fast
- If you think about dividing words into syllables, it will slow you down
- The process is artificial and unlike real reading

rep      tile

        c                  v-e

# Our recommendation

- Do not teach strict syllable division
- Use a more flexible strategy instead

## Overt Strategy

1. Circle the prefixes.
2. Circle the suffixes.
3. Underline the vowels.
4. Say the parts of the word.
5. Say the whole word.
6. Make it a real word.

EXAMPLE

reconstruction

## Covert Strategy

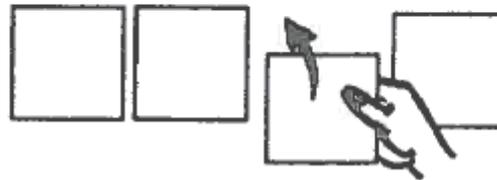
1. Look for prefixes, suffixes, and vowels.
2. Say the parts of the word.
3. Say the whole word.
4. Make it a real word.

# 7. Phonological awareness at the syllable level

- Only one study explicitly included this practice
  - Kennedy & Backman (1993)
- We did not find strong phonological effects for polysyllabic word reading

T: *That says gaptional; show me gaptural.*

S: Add a *-ture*. (Add felt before *-al*.)



# Our recommendation

- Phonological awareness might be helpful for placing stress
- At this level, it makes sense to link sounds to letters
- Practice manipulating chains of words, but let students see the written words

pre scrip tive

pre scrip tion

pre ven tion

con ven tion

But this is a terrible word  
for actual instruction

con scrip tion

# Additional recommendations

# 1. Make sure foundational skills are solidly in place already

- Large sight word vocabulary
  - Fast, completely accurate retrieval for top 500 sight words
  - Expanding store of other words children know
- Letter-sound knowledge including GPCs, digraphs, r-controlled vowels, and phonograms
  - Accurate pronunciation of sounds (esp. short vowels)
- Decoding skill for monosyllabic words with up to six sounds (e.g., *script*, *cramps*)
  - Quick, accurate decoding without reliance on guessing, context, reading on, or using pictures

devinkearns.org

Filter

Letter Pattern **' \_ a**

IPA **/ə/ /ɪ/**

Sound Spellings Selected **a\_e = /e/ ✕**

### Word List

Max Syllables 1  10

abase	[a = /@/]	[b = /b/]	[a_e = /e/]
abased	[a = /@/]	[b = /b/]	[a_e = /e/]
abate	[a = /@/]	[b = /b/]	[a_e = /e/]
abates	[a = /@/]	[b = /b/]	[a_e = /e/]
ablaze	[a = /@/]	[b = /b/]	[a_e = /e/]
abrade	[a = /@/]	[b = /b/]	[a_e = /e/]
abrades	[a = /@/]	[b = /b/]	[a_e = /e/]
ace	[a_e = /e/]	[c = /s/]	
aerate	[ae = /E/]	[r = /r/]	

devinkearns.org

Filter

Letter Pattern **' \_ a a\_e aa ae agh ah ai**

IPA **/ə/ /ɪ/ /a/ /æ/ /ɔ/ /e/ /ɪ/**

Sound Spellings Selected **a\_e = /e/ ✕**

### Word List

Max Syllables 1  10

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abase	[a = /@/]	[b = /b/]	[a_e = /e/]	[s = /s/]	
abased	[a = /@/]	[b = /b/]	[a_e = /e/]	[s = /s/]	[d = /t/]
abate	[a = /@/]	[b = /b/]	[a_e = /e/]	[t = /t/]	

## 2. Draw students' attention to stress patterns

- Do not teach rules for stress; they are too complicated
- Link to real words (again, use words they know)

# Thank you very much!

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