

Vocabulary: The Key to UnLocking Knowledge

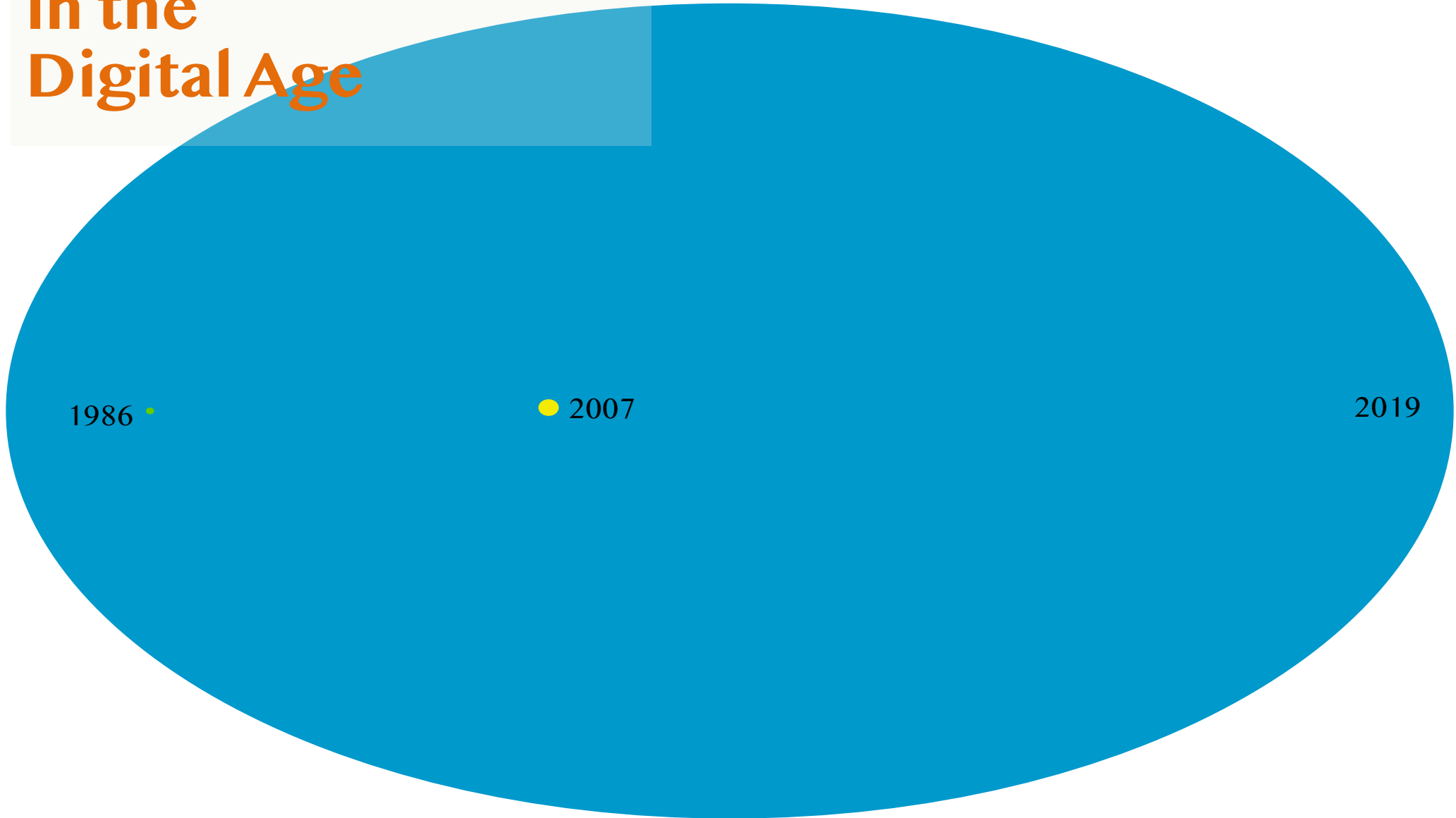
Elfrieda H. Hiebert
TextProject

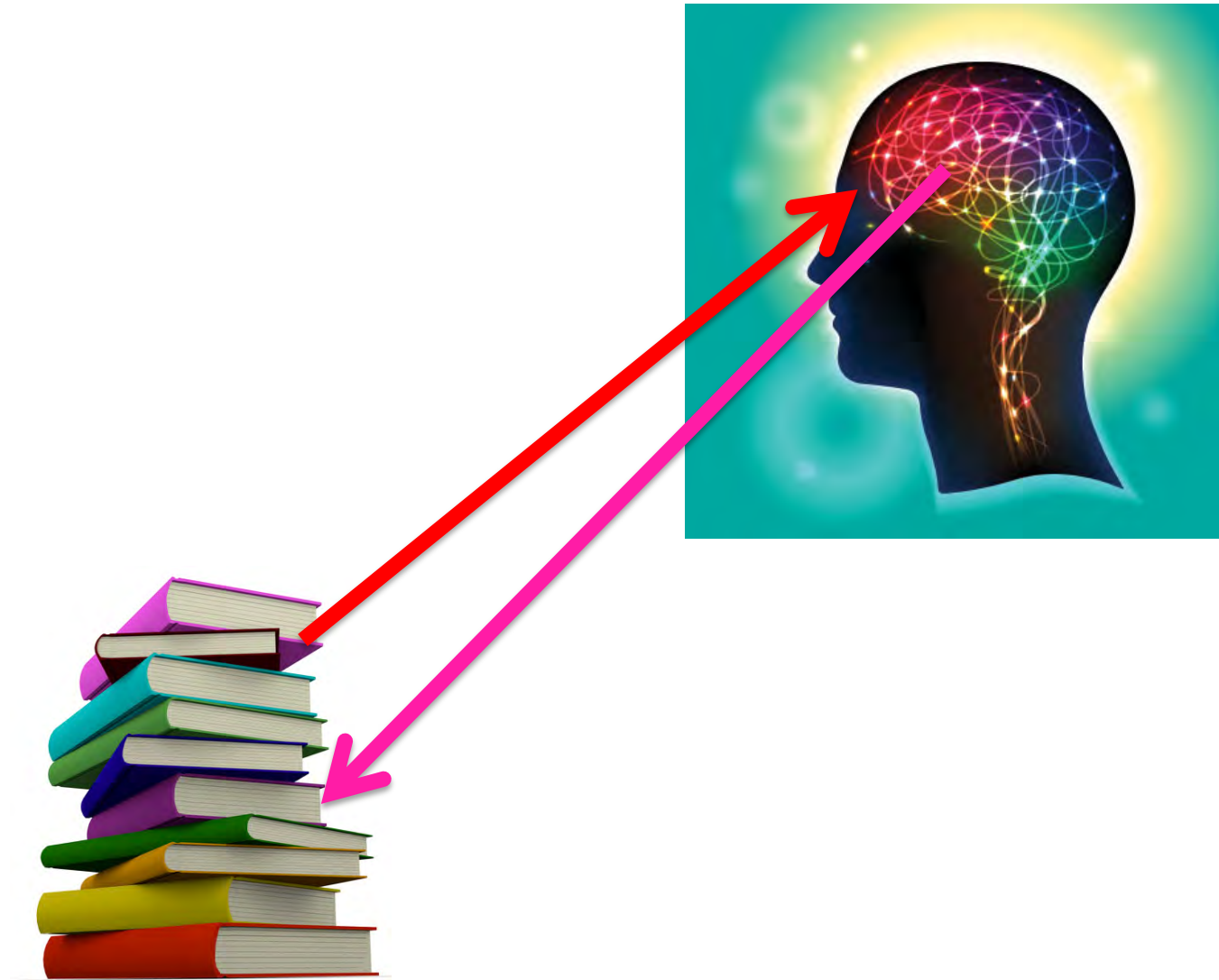
Knowledge in the Digital Age

1986 •

● 2007

2019





Idea 1: You can't teach all English words but you can teach students about the underlying systems.

ENGLISH HAS THREE DISTINCT MORPHOLOGICAL SYSTEMS.



Small Changes for Understanding the English Lexicon

**GREEK/
LATIN**

Technical words
New words by com-
pounding: graph, para-
graph (s), photograph (s),
telegraph

ROMANCE

Most literacy and academic words
New Words through derivations:
separate, separates, separating, separ-
ated, separation, separately, separable

ANGLO-SAXON

Common, everyday, down-to-earth words
New words through compounding:
field (s), airfield (s), battlefield (s), cornfield (s)

DISCUSSION 2

1. What percentage of the vocabulary is the same across end-of-year texts for Grades 3, 5, & 7?

M-STEP Grade 3

One afternoon, Jessie spotted a tiny bird fluttering around Mrs. Baxter's front door. Mrs. Baxter had just moved into an apartment. It's probably looking for somebody to fill the bird feeders, Jessie thought. The bird perched on the edge of the wreath. Then it disappeared.

Disappeared? Jessie ran over to Mrs. Baxter's door. Where had it gone?

A jumble of sticks and grass stuck out from the middle of the wreath. Suddenly, Jessie understood. A nest! A bird's nest sat right in the middle of Mrs. Baxter's wreath. The bird poked its head out and looked at Jessie. Then it fluttered away.

M-STEP Grade 5

Hermit crabs are nature's recyclers. Like many other crabs, the hermit crab eats waste. By living on sea scraps, hermit crabs help keep oceans and shores clean. Some hermit crabs hide in reefs or live in shallow waters, while others scuttle on the ocean floor. There are also hermit crabs that spend most of their lives ashore.

Unlike other crabs, the hermit crab has a thin outer shell over its soft tail. This makes the hermit crab easy prey for hungry predators. Hermit crabs stay safe by living in old seashells. A hermit crab is picky; it tries on many shells until it finds one that fits just right.

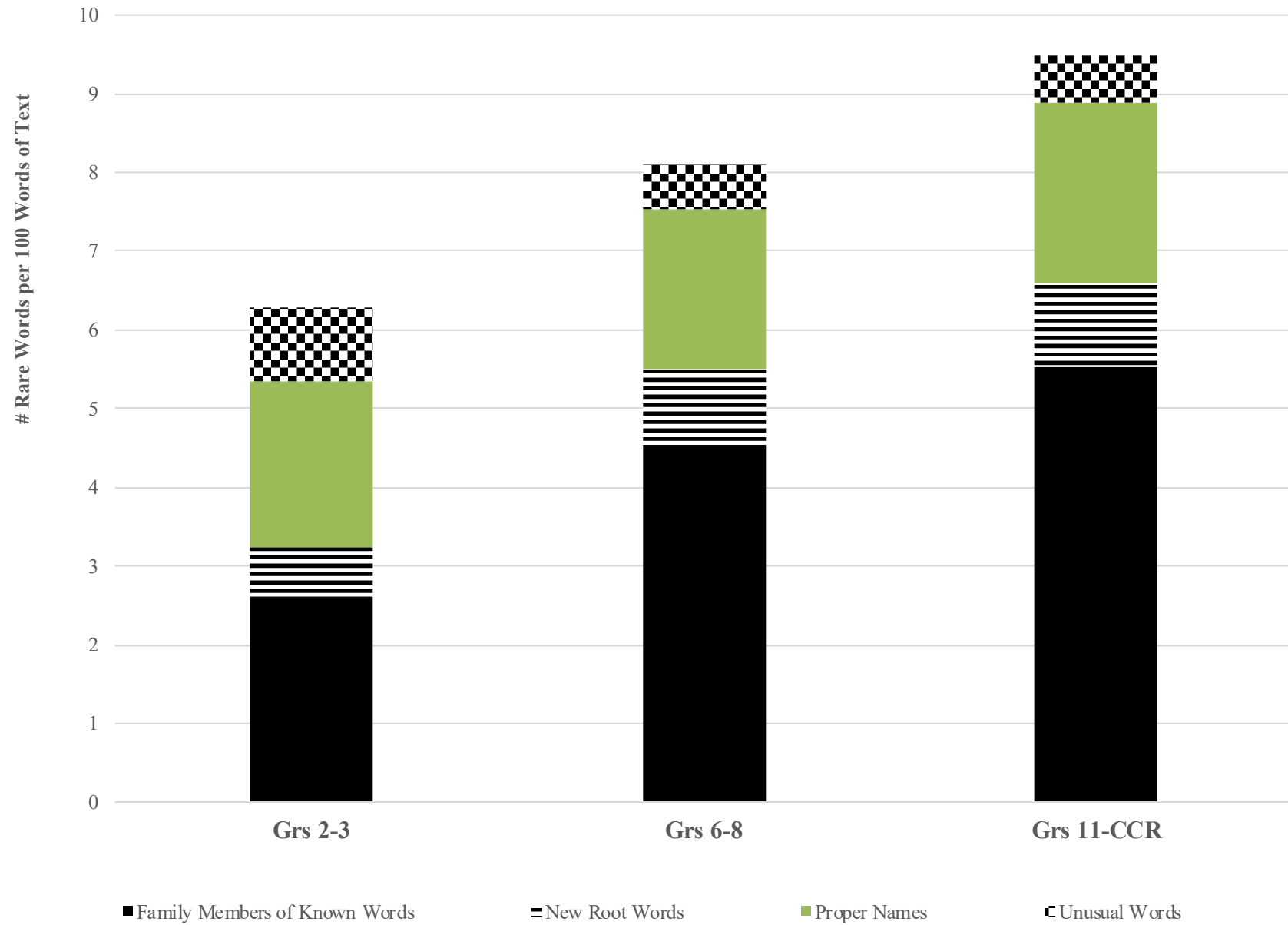
M-STEP Grade 7

Like all living things, you need energy. The energy you use to live every day travels from one living thing to another, in a chain that starts with the sun.

The energy in all your food comes from the sun, million miles away. How did the sun's energy end up in the things you eat? You can thank green plants. They contain **chlorophyll**, a substance that traps the energy in sunlight. This energy then helps plants change water from the soil and carbon **dioxide** from the air into oxygen and **carbohydrates** that power their cells. This process is called **photosynthesis**.

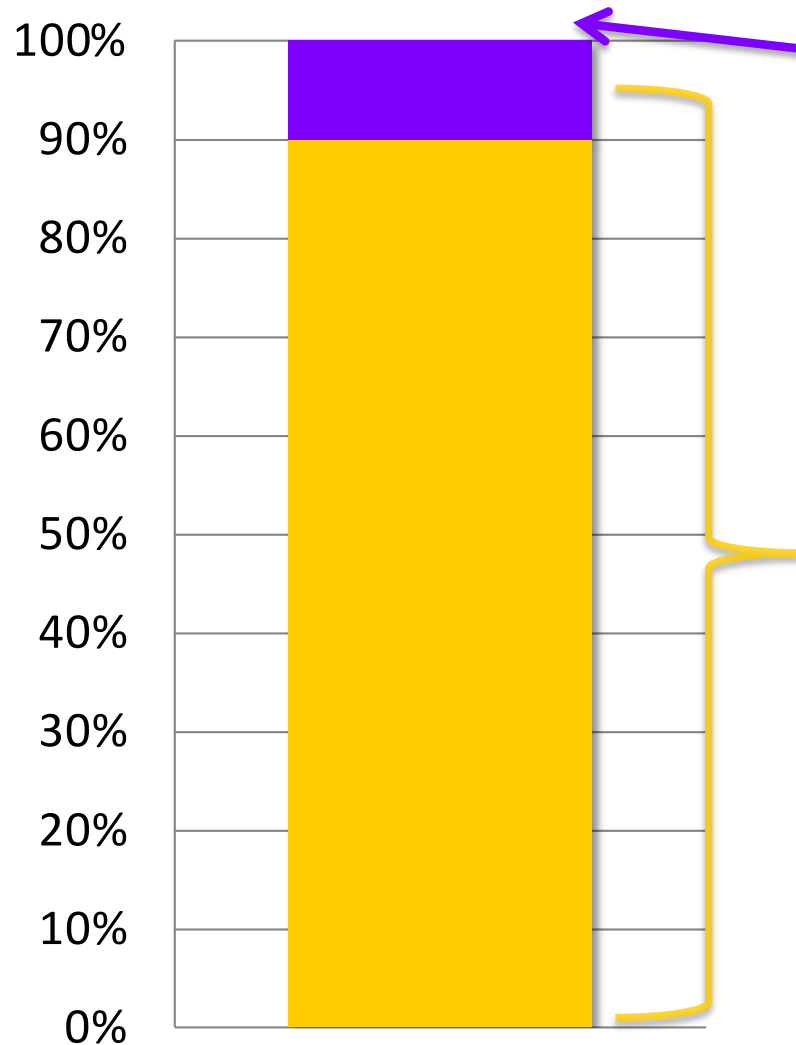
Most plants make more food than they need.

Types of Rare Words in Narrative Texts (from Pugh & Hiebert, 2018)



Idea 2: A small group of words does the heavy lifting in English.

The distribution of words in written English



10% “Unique” or “Complex” Words:
around 88,000 word families/200,000+ words

90% “Core” Words:
• 2,500 complex word families (*+helpful, unhelpful, helpless*)

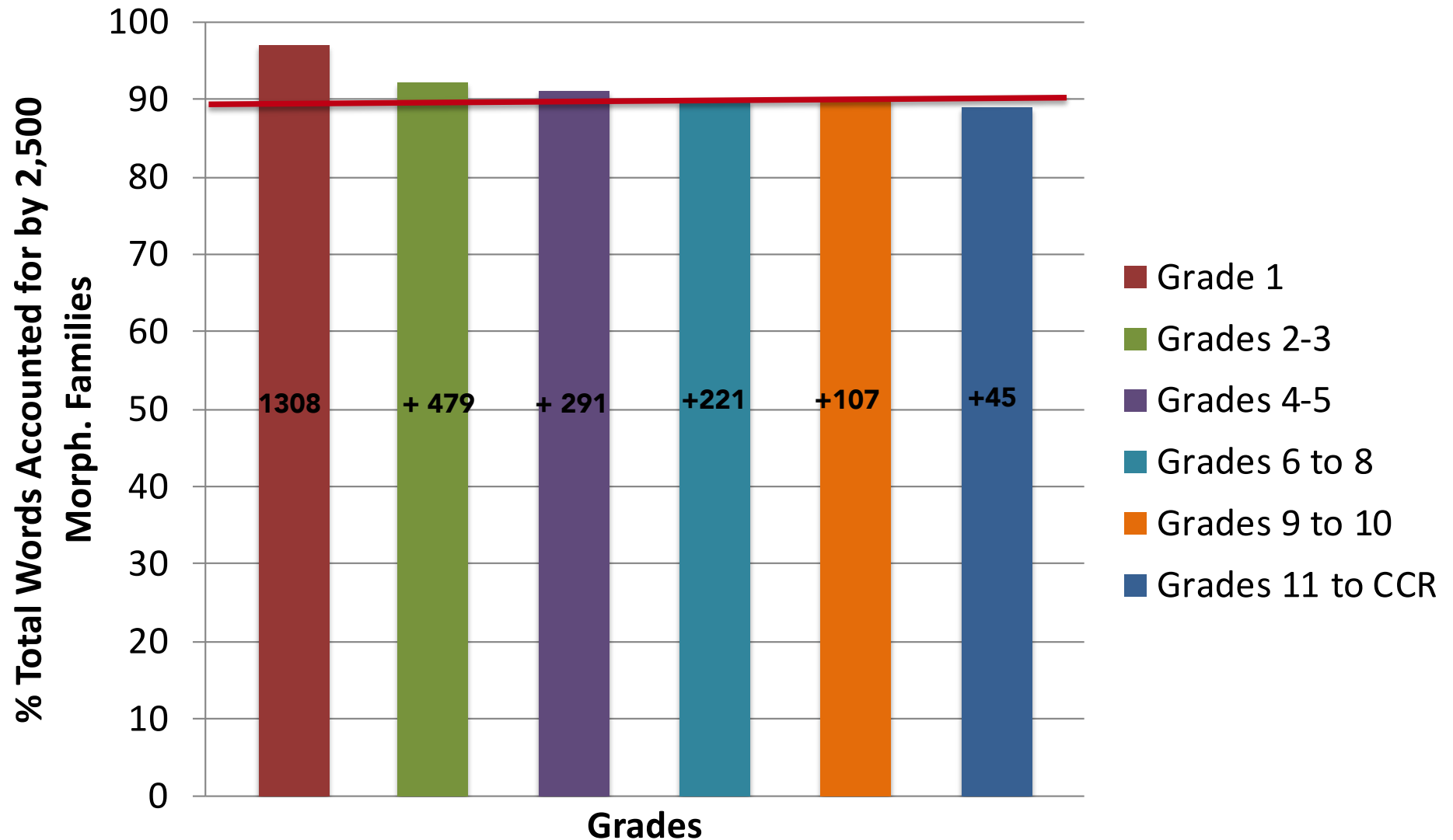
http://textproject.org/assets/library/resources/WordZones_4000-simple-word-families.pdf

Examples of the Words in the Core Vocabulary

	words
1st 100	the, by, no, through, must
101-300	long, great, put, last, family
301-1,000	power, north, story, strong, answer
1,001-1,500	valley, imagine, motion, nearby, importance
1,501-2,000	character, responsible, design, presence, trail
2001-2,500	mixture, discovery, civilization, attitude, assume

Analysis of a Million Word Corpus

(Exemplars from Common Core State Standards)



Small Changes for Supporting students' core vocabulary

Talking
Points

For
Teachers

2a. Hold Conversations About Ratio of Rare to Core Words in Texts

Why?

- Develop the understanding that every complex text has new, challenging vocabulary. Vocabulary instruction gives students the means for figuring out new words in text, not instruction in every single word that might appear in new texts.

When?

- Talks about the vocabulary of new texts need to occur across a school year (with extra doses prior to assessment periods).

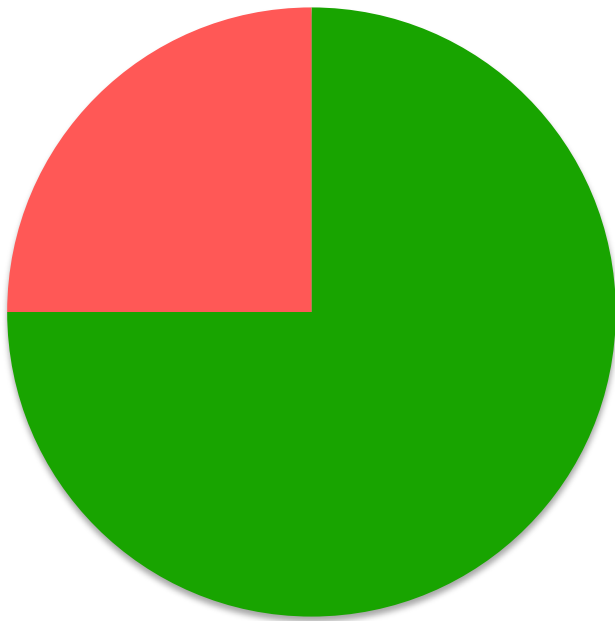
How?

- Demonstrate the nature of vocabulary with texts.

When 10-year old Amelia Mary Earhart saw her first plane at a state fair, she was not impressed. “It was a thing of rusty wire and wood and looked not at all interesting,” she said. It wasn’t until Earhart attended a stunt flying exhibition, almost a decade later, that she became seriously interested in aviation.

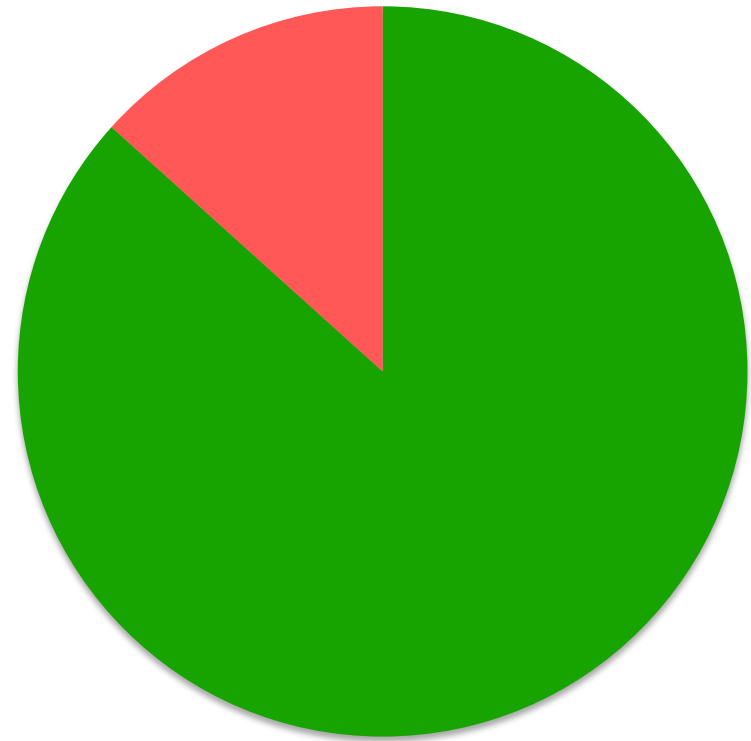
2b. Increase students' RESPONSIBILITY FOR READING text

**Reading Instruction (1970s
to late 1980s)**



■ Instruction ■ Time Spent reading

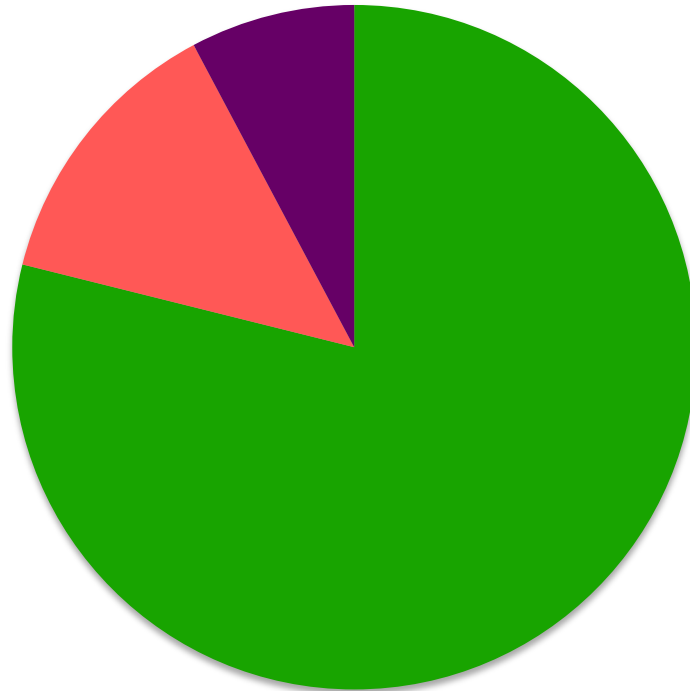
Reading Instruction (late 1990s -)



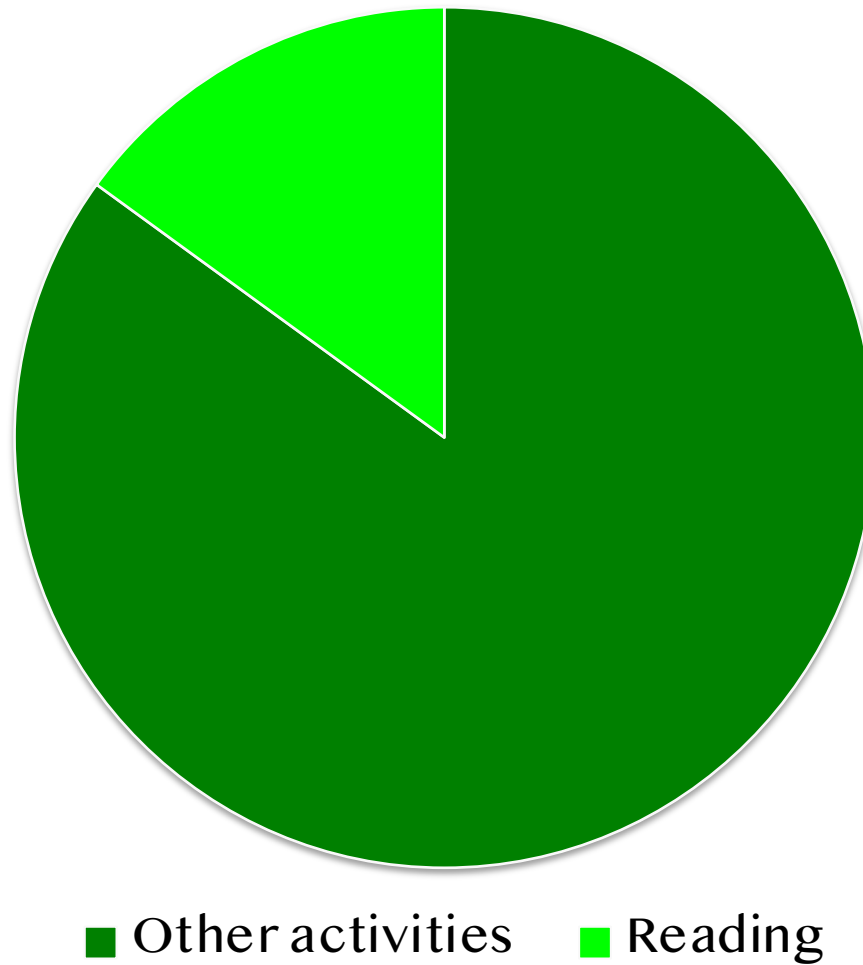
■ Instruction ■ Time Spent reading

7 Minutes of Additional Reading

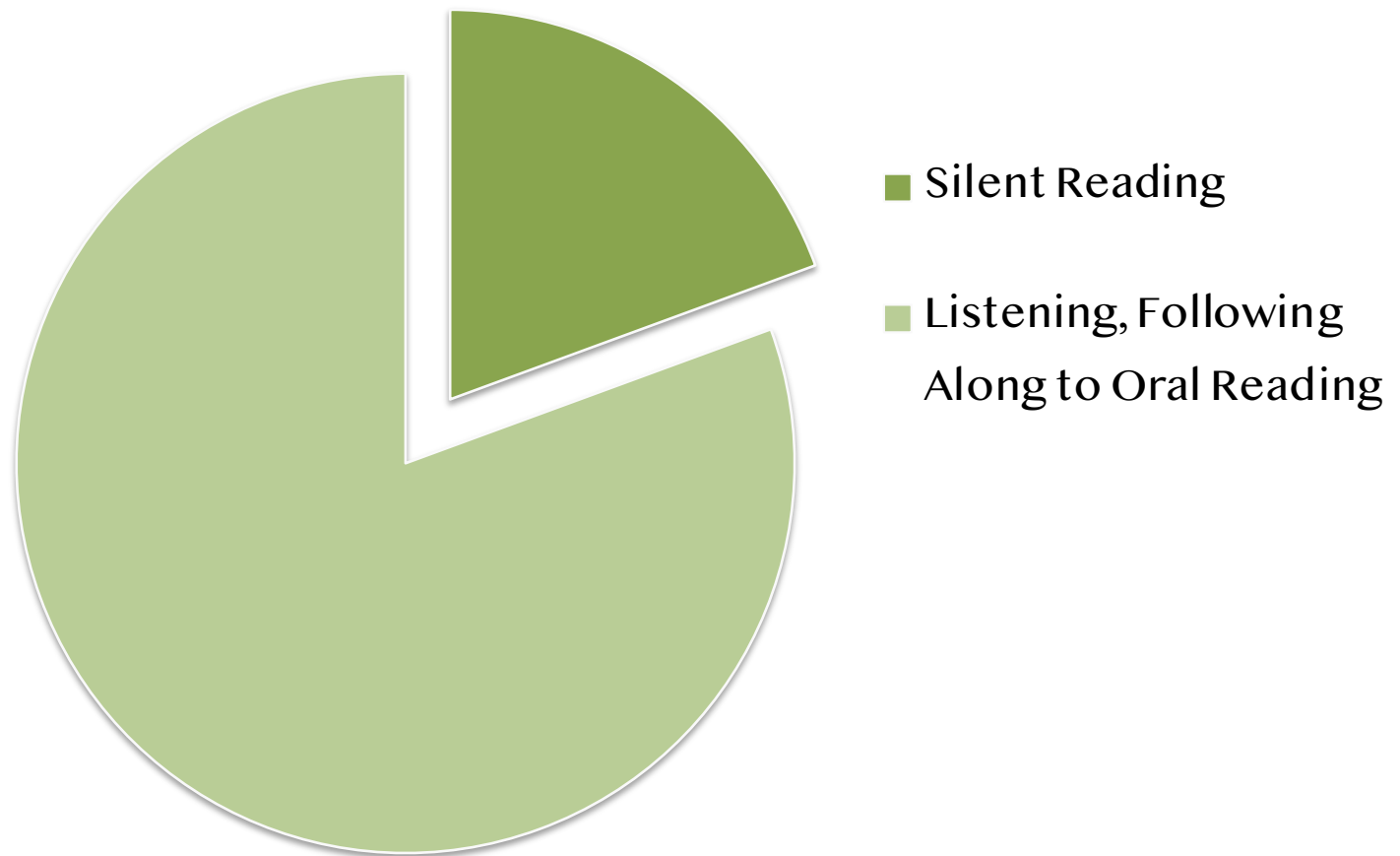
**Reading Instruction
(w/ 7 additional minutes)**



■ Instruction ■ Time Spent reading ■ Additional 7 minutes



Swanson, Wanzek, McCulley, Stillman-Spisask,
Vaughn, Simmons, Fogarty, & Hairrell, 2015.



2c. Increase students' reading: Topically connected articles

**Readworks.org has
approximately 4,500 free
passages for Grades 1-High
School—including 450
curated sets of articles in the
Read-an-Article-a-Day
initiative**



Clouds and Rain

ARTICLE-A-DAY SET

Earth & Space Science

1st Articles range from 220L to 790L Informational



Animals from Different Places

ARTICLE-A-DAY SET

Sports, Health & Safety, Life Science, Earth & Space Science

1st Articles range from 300L to 540L Informational



Jobs and Careers

ARTICLE-A-DAY SET

Geography & Societies, Sports, Health & Safety, School & Family Life, Arts & Culture, Technology & Engineering

2nd Articles range from 270L to 650L Informational



Health and Body

ARTICLE-A-DAY SET

Sports, Health & Safety, School & Family Life, Life Science

2nd Articles range from 480L to 710L Informational

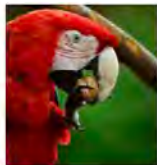


Animal Senses, Safety, and Homes

ARTICLE-A-DAY SET

Geography & Societies, Life Science

2nd Articles range from 500L to 630L Informational

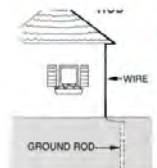


Exploring Continents

ARTICLE-A-DAY SET

World History, Geography & Societies, Life Science, Earth & Space Science

2nd Articles range from 530L to 710L Informational



Inventions

ARTICLE-A-DAY SET

Winter Season, Technology & Engineering

1st Articles range from 250L to 570L Informational



Amphibians and Reptiles

ARTICLE-A-DAY SET

U.S. History, Geography & Societies, Life Science, Earth & Space Science

2nd Articles range from 430L to 760L Informational

The Article-a-Day Initiative: Sets of articles for a week around a topic; articles cover a range of complexity levels

2d. Sorting Texts by Topic

Table 3. Moderately Frequent Words With Repetitions (3 times plus)¹ in Semantically Connected Groups in Two Text Sets

Text Complexity	Topic + Text Complexity
1) journey 4 ² train 5 explorers 5	1) flower 6 garden 6 harvest 3 nutty 3 orange 7 seeds 3 vegetable 3 vines 9
2) protect 4 safety 5 chemicals 3 competitions 5 created 3 double 4 melted 4 meter 3 mount 4 music 6 palace 3 threw 3 trick 5 volcano 8	2) healthy 3 nutrients 4 vitamin 3 3) competition 3 contests 3 winners 9 4) transport 3 truck 4 5) scales 3 weighed 7 carve 4 chains 10 circle 3 create 4 football 3 native 3 patch 6 perfect 3 smooth 3 sweet 3

¹Proper names and words with 4 or fewer letters excluded

²Number of times word is repeated in the sample of 2,300 words.

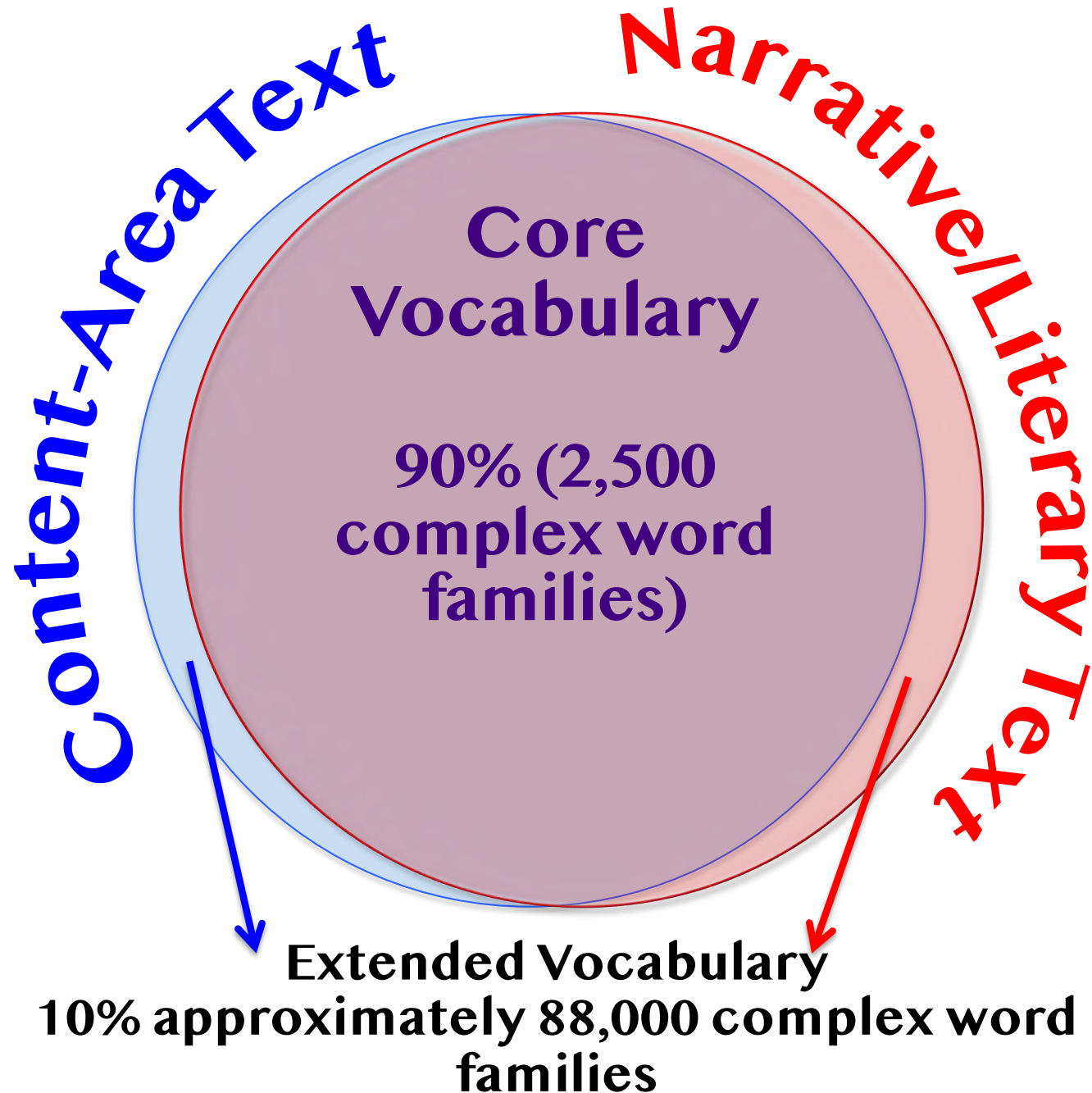
Idea	Action	Open-Access Resource
1. English has more words than can be taught.	1. Teach students to expect new words in texts.	1. Vocabulary Triangle
2. A small group of words does the heavy lifting in English.	2. Increase volume of reading	2a. Hold conversations about rare:core ratio in texts 2b. 7 minutes of additional reading daily 2c. Increase magazine reading 2d. Organize texts by topics, not just text complexity
3. Rare words in narrative texts belong to synonym networks; those in informational texts in	3. Teach students prolific synonym networks & organize topics into networks	3. Super Synonym Sets for Stories (S4) Exceptional Expressions in Everyday Events (E4)

Discussion 3

- 1. How do you teach rare vocabulary in narrative texts? In expository texts?

**Idea 3: Rare words are part
of networks**

The Other 10%: Rare Words in Writing



Narrative Text

Even with eyes protected by the green spectacles, Dorothy and her friends were at first dazzled by the brilliancy of the wonderful City. The streets were lined with beautiful houses all built of green marble and studded everywhere with sparkling emeralds. They walked over a pavement of the same green marble, and where the blocks were joined together were rows of emeralds, set closely, and glittering in the brightness of the sun. The window panes were of green glass; even the sky above the City had a green tint, and the rays of the sun were green.

From *The Wonderful Wizard of Oz* Frank Baum)

(a)
**Networks in
narratives
are
synonyms
related to
story
elements.**

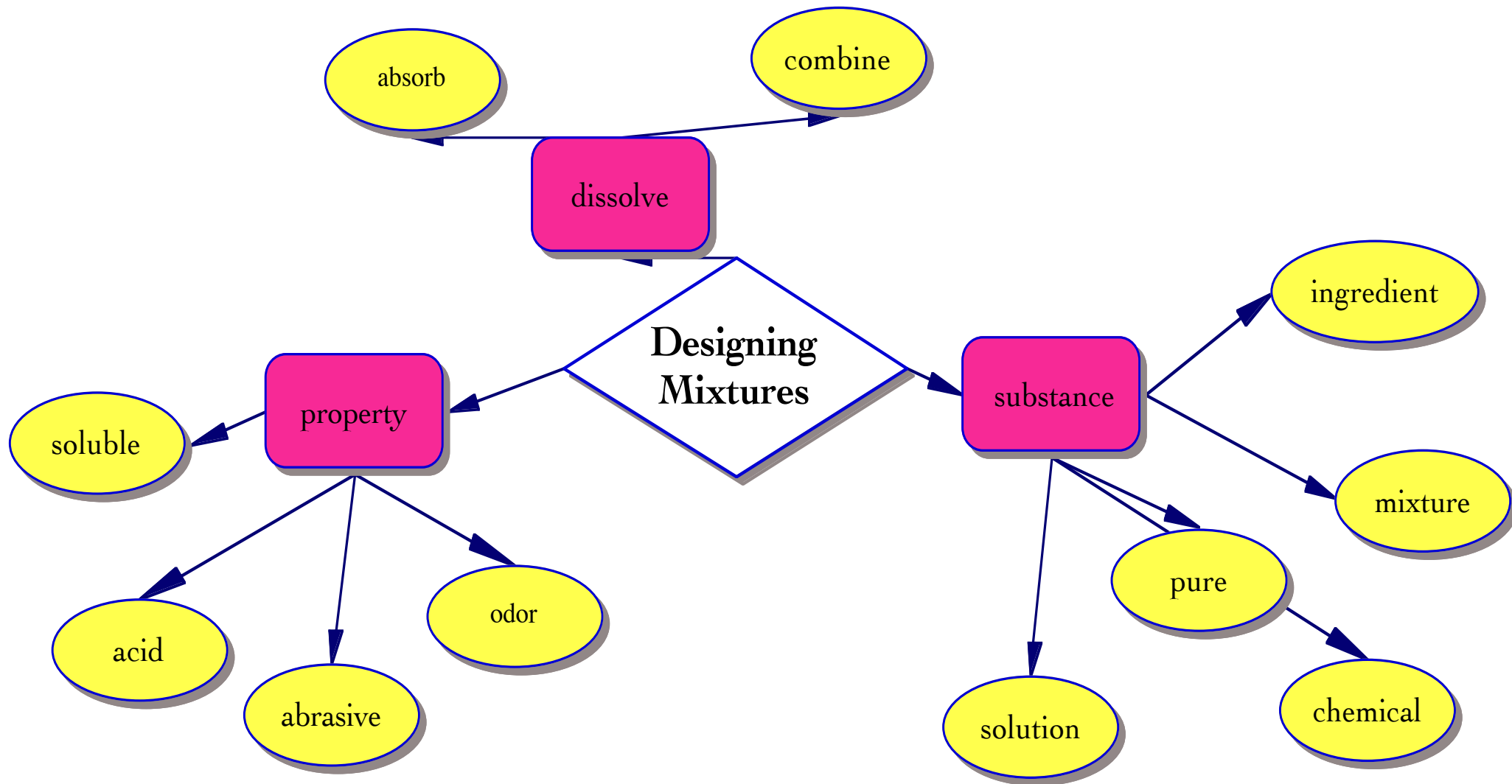
Story Word	Other Possibilities
dazzled	hypnotized awed
brilliancy	effulgence luminosity
glittering	shimmering radiance

(b) The rare words in
informational texts
belong to topical
networks.

Informational Text

A simple solution is basically two substances that are evenly mixed together. One of them is called the **solute** and the other is the **solvent**. A solute is the substance to be dissolved (sugar). The **solvent** is the one doing the dissolving (water). As a rule of thumb, there is usually more **solvent** than **solute**. The amount of **solute** that can be dissolved by the **solvent** is defined as **solubility**.

An Example of a Topical Network



Small Changes for Supporting Knowledge of Rare Vocabulary



Synonym Networks in Narrative Texts

Prolific Groups of Synonyms

Communication /Internal Processes (verbs)	Emotions (adjectives)	Movement (verbs)	Traits (adjectives)
think	happy	go	funny
argue	sad	send	smart
look	mad	start	brave
guess	hope	stop	selfish
said	fear	stay	shy



Guess as in to give an unsure reply (verb):

- suppose
- reckon
- judge
- gauge
- approximate

Guess as in to give an unsure reply (verb):

- theorize
- estimate
- surmise
- speculate

Guess as in a response that is based on opinion, not fact (noun):

- assumption
- opinion
- conjecture
- speculation
- supposition
- surmise

??
Guess

COMMON PHRASES

- Keep them guessing
- Guess what
- Anyone's guess
- Take a guess
- Educated Guess

IDIOMS

- Take a stab in the dark
- Wild guess
- Take a gander

SPANISH CONNECTIONS

- theorize / teorizar
- estimate / estimar
- speculate / especular
- conjecture / conjetura



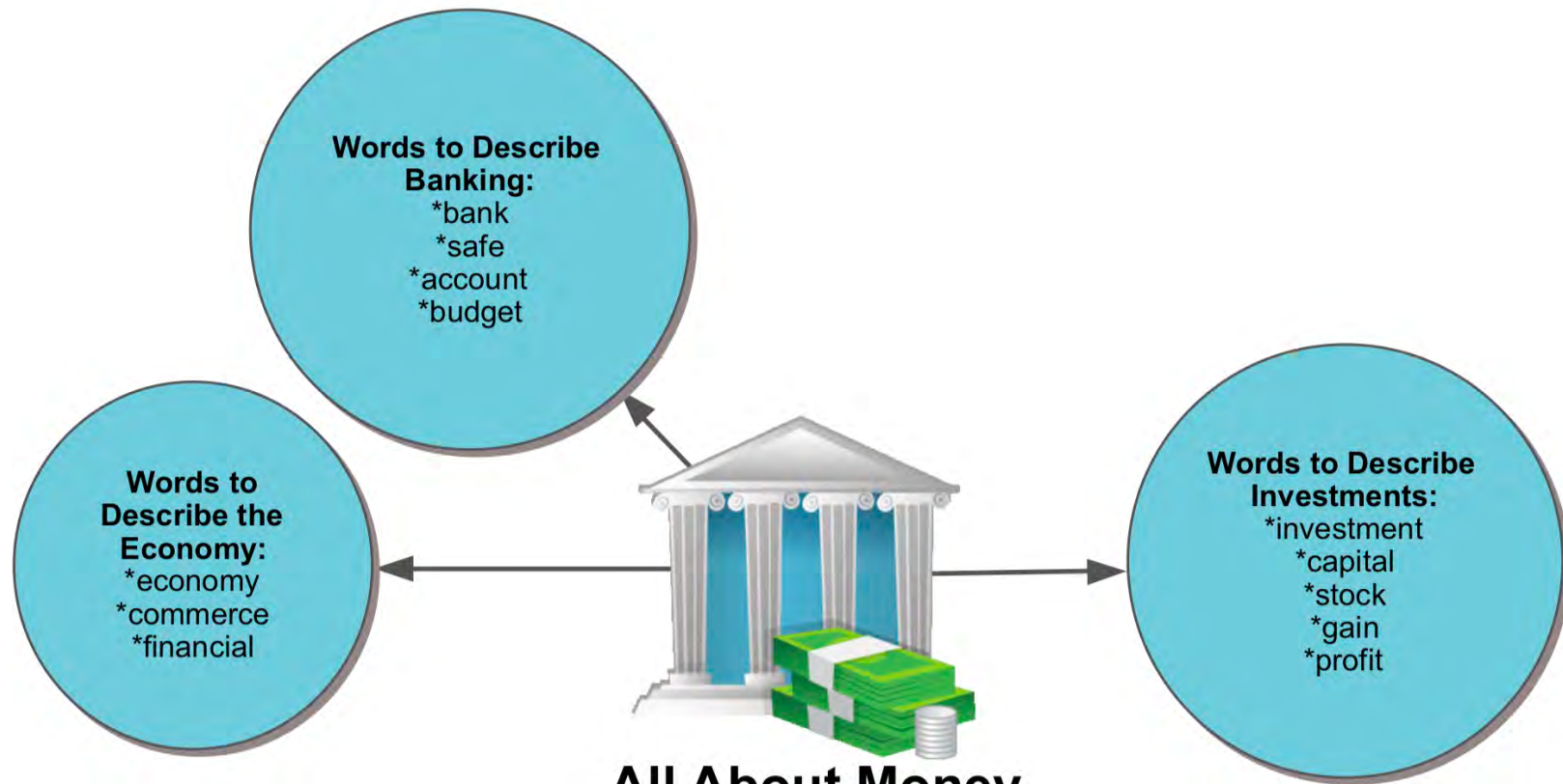
All About Money—

Words to Describe Money and Having
or Not Having Money

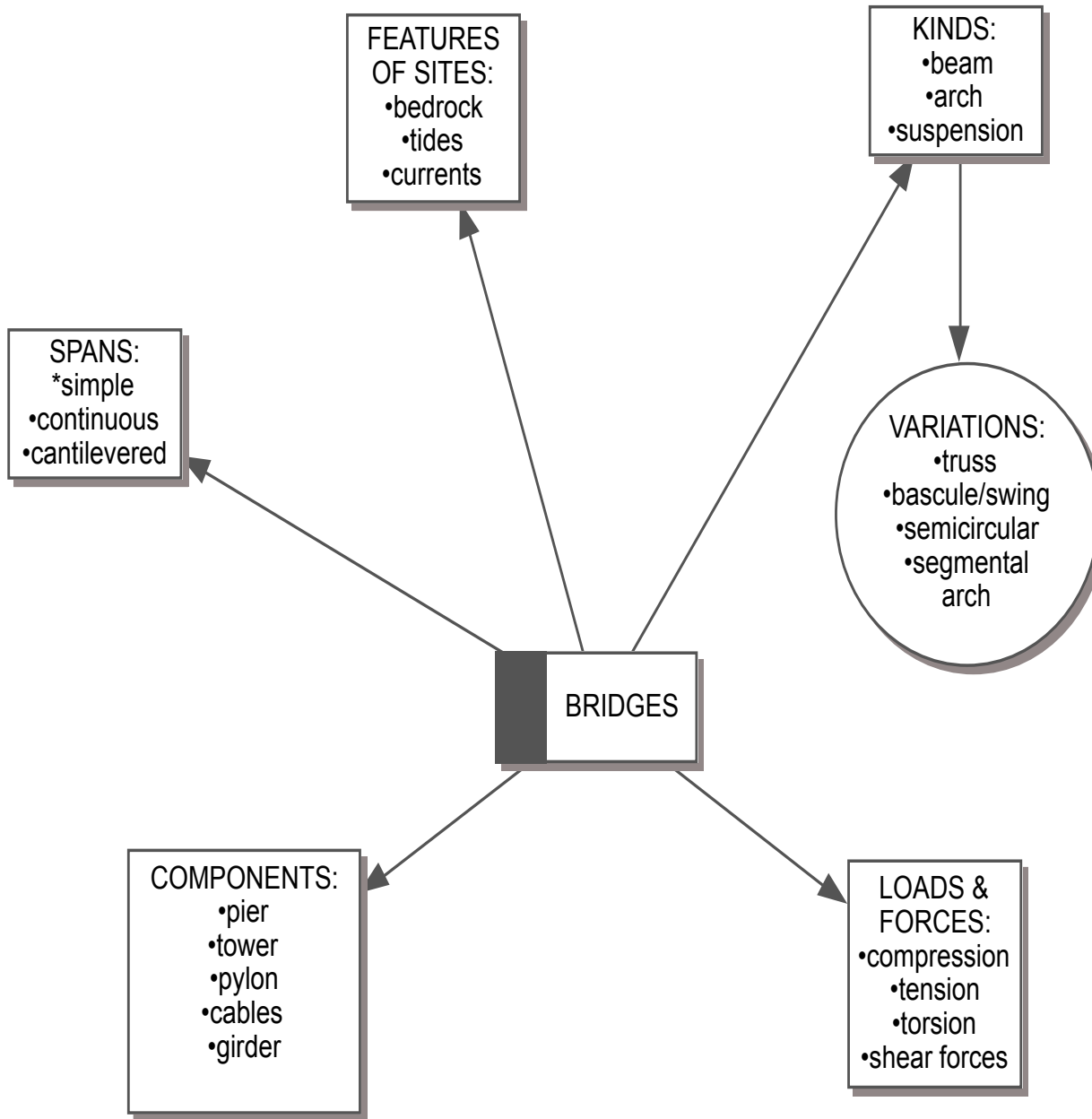


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**All About Money—
Words to Describe the Economy, Banking,
and Investments**



Teach students to expect—and in some cases—learn proper names

First Names & Surnames—Author's Choices	Characters, Objects, Events	Experts & Their Affiliations	Geographic Names
Mr. Augsburger	Niña	John T. Caioppo, University of Chicago	Buddhist
Mr. & Mrs. Sandlin	Pinta	Jacqueline Olds & Richard S. Schwartz, Harvard	Brooklyn Bridge
Mr. Bates	Cultural Revolution	Robert D. Putnam	Sagarmatha
Thomases	Mao	Mei Lanfang	Shangri-La
Byford	Red Fushi	Bradley Morris & Shannon Zentall	Shanghai
Mrs. Andrews	Red Guard	Carol Dweck, Stanford	Sherpa

Idea	Small Change	Open-Access Resource
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3. Rare words in narrative texts belong to synonym networks; those in informational texts in topic networks.	3. Teach students prolific synonym networks & organize topics into networks.	3. Super Synonym Sets for Stories (S4) for narrative texts • Use semantic maps for informational texts, such as those in Word Pictures

- Visit us at textproject.org where all resources are available for free download.