THE KNOWLEDGE BASE OF ENGLISH/LANGUAGE ARTS: VOCABULARY AS A SOURCE

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TextProject
Knowledge is central to comprehension (Ahmed, Francis, York, Fletcher, Barnes, & Kulesz, 2016).

- **Theoretical models:** Graesser, Singer, & Trabasso, 1994; Kintsch, 1998; van den Broek, Risden, Fletcher, & Thurlow, 1996
A leaf uses sunlight and air to help the plant make food. Broad leaves help the plant trap energy from sunlight. (HMH Science, Grade 4, p. A20)
Common Core State Standards for Reading

CCSS.ELA-LITERACY.RL.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

CCSS.ELA-LITERACY.RL.4.2 Determine a theme of a story, drama, or poem from details in the text; summarize the text.

CCSS.ELA-LITERACY.RL.4.3 Describe in depth a character, setting, or event in a story or drama, drawing on specific details in the text (e.g., a character's thoughts, words, or actions).
Five Boiled Eggs
An Old Turkish Tale
retold by Laura S. Sassi

Introduction: Nasreddin Hodja, a character in this story, is familiar in many Turkish legends. *Hodja* means teacher.

Long ago, a poor country boy left home to seek his fortune. Day and night he traveled, stopping to eat at inns along the way. Though he ate sparingly, his money quickly dwindled until, one day, no silver akches* remained.

Still, the boy kept walking. Soon, however, his empty belly began to ache. Staggering up to the next inn he saw, he approached the innkeeper.

"Please feed me!" he said. "I don't have any money now, but I promise to pay you as soon as I can."

"I'll see what I can spare," the innkeeper

The famished lad gratefully gobbled every morsel. Then, repeating his promise to pay back the innkeeper, he journeyed on.

Revived by his five-egg breakfast, the boy soon reached a bustling seaport. Intent on finding his fortune, he set sail on the first ship that was leaving the harbor.

Years passed, and the lad prospered. As a sea merchant, he sailed far, stopping in many exotic ports. However, he never forgot his humble beginnings or the money he owed the innkeeper.

When he finally returned home, he stopped by the old roadside inn.

*An akche is a unit of Turkish money.*

What did the boy do to become successful?

A  He raised hens from the eggs the innkeeper gave him.
B  He became a sea merchant and traveled to many places.
C  He learned from the innkeeper how to make his fortune.
D  He borrowed money to buy a new sailing ship.
Unwrapping the Past: Recognize main topic of informational article

Mummies have been buried in Egypt for thousands of years. We have learned a lot about ancient Egypt from them. But they have also been quite a puzzle to scientists. A mummy is a dead body that has been preserved with special chemicals and wrapped in cloth (see Making Mummies, p. 4). It was only in the last 15 years that experts figured out how this process worked.

But now, with the help of high-tech tools, scientists are unraveling more secrets from these ancient remains. The details of their lives are coming to light like never before. But experts say they are not only learning the past. Mummies may also help explain modern medical mysteries.

Tales of the Dead

In the past when scientists studied cut through the body, or unwrap it. I inside a mummy while it is whole.

What is the article mainly about?

A  Why the ancient Egyptians made mummies
B  What the study of mummies can teach us
C  Where an ancient Egyptian mummy was found
D  How researchers unwrap mummies
Overlap between Topics/Vocabulary of NAEP Passages & a Gr. 4 Core Reading Program

Of the moderately frequent or rare words in either NAEP texts, only one appears in the 2,196 moderately frequent/rare words of a grade-four reading program: stole.

Narrative Topics
- A tall tale (Heat Wave)
- Realistic fiction of an immigrant boy getting access to the public library
- Chris Van Allsburg’s The Stranger
- A Caribbean version of Cinderella
- Tale of Juan Verdades

Informational Topics
- Wildfires
- Finding the Titanic
- Biography of Gloria Estefan
- Salmon Summer: photo-essay about an Aleut boy at a fishing camp
- Donn Fendler’s account of being lost in a mountain storm
PROPOSALS FOR THE KNOWLEDGE BASE OF ELA
E.D. Hirsch, Jr.  
*(Cultural Literacy, 1988) & Core Knowledge Curriculum*
In grades K–12, the English language arts standards will ensure that all students have opportunities to engage successfully in discovering, creating, and analyzing spoken, written, electronic, and visual texts which reflect multiple perspectives and diverse communities. All students will:

1. **Meaning and Communication**: focus on meaning and communication as they listen, speak, view, read, and write in personal, social, occupational, and civic contexts;

2. **Language**: use the English language effectively in informal situations within schools, communities, and workplaces by building upon an understanding of their own and other language patterns;

3. **Literature**: interact with a wide variety of classic and contemporary literature and other texts to seek information, ideas, enjoyment, and understanding of their individuality, our common humanity, and the rich diversity in our society;

4. **Voice**: view themselves as effective speakers and writers and demonstrate their expressive abilities by creating oral, written, and visual texts that engage their audiences;

5. **Skills and Processes**: demonstrate, monitor, and reflect upon the skills and processes used to communicate through listening, speaking, viewing, reading, and writing;

6. **Genre and Craft of Language**: explore and use the characteristics of different types of texts, aesthetic elements, and mechanics—including text structure, figurative and descriptive language, spelling, punctuation, and grammar—to construct and convey meaning;

7. **Depth of Understanding**: demonstrate understanding of the complexity of enduring issues and recurring problems by making connections and generating themes within and across texts;

8. **Ideas in Action**: apply knowledge, ideas, and issues drawn from texts to their lives and the lives of others;

9. **Inquiry and Research**: define and investigate important issues and problems using a variety of resources, including technology, to explore and create texts; and

10. **Critical Standards**: develop and apply personal, shared, and academic criteria for the enjoyment, appreciation, and evaluation of their own and others’ oral, written, and visual texts.
## “Interesting List” Approach
(e.g., Hiebert, 2020)

<table>
<thead>
<tr>
<th>Child-Friendly Title</th>
<th>Content Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making Beautiful Things: Art, Fashion, &amp; Movies</td>
<td>Fine Arts</td>
</tr>
<tr>
<td>Blast from the Past</td>
<td>History</td>
</tr>
<tr>
<td>Designing &amp; Inventing: Engineering &amp; Architecture</td>
<td>Physical Science</td>
</tr>
<tr>
<td>Heroes and Famous People</td>
<td>History/Human Interest</td>
</tr>
<tr>
<td>How Things Work: On Earth &amp; in Space</td>
<td>Physical Science &amp; Astronomy</td>
</tr>
<tr>
<td>Learning About Myself, Friends, &amp; Family</td>
<td>Social and Emotional Learning</td>
</tr>
<tr>
<td>Making and Celebrating Communities</td>
<td>Culture/Civics</td>
</tr>
<tr>
<td>Rhymes and Rhythm: Poetry &amp; Music</td>
<td>Literature and Fine Arts</td>
</tr>
<tr>
<td>Health and Sports</td>
<td>Life Sciences</td>
</tr>
<tr>
<td>Stories We Tell: New &amp; Old</td>
<td>Literature and Social/Emotional Learning</td>
</tr>
<tr>
<td>The Living World: Habitats, Animals, &amp; Weather</td>
<td>Life Sciences</td>
</tr>
<tr>
<td>Travel and Places</td>
<td>Geography</td>
</tr>
</tbody>
</table>
Another View: Vocabulary as a Means for Developing Background Knowledge

- Use of vocabulary to measure knowledge

O’Reilly, Wang, & Sabatini (Psychological Science, 2019) gave a background-knowledge test to 3,534 high school students before administering a reading-comprehension test on the topic of ecology. Below the threshold, the relationship between comprehension and knowledge was weak ($\beta = 0.18$), but above the threshold, a strong, positive relation emerged ($\beta = 0.81$).

- Simply using students’ performance on six words (e.g., ecosystem, habitat), they were able to correctly identify the great majority of students who were below the knowledge threshold.
Rationale for a Semantic Cluster Approach

- Wright & Cervetti (2017): “There is very limited evidence that direct teaching of word meanings, even long-term, multi-faceted interventions of large numbers of words, can improve generalized comprehension” (p. 203).

  - Over a 5-month period, Beck et al. taught 12 semantic clusters, each having to do with critical aspects of narratives: characters, movement, traits, and communication.
  - When 2 clusters were taught over a month-long period (with varying degrees of repetition), a generalized effect for comprehension was not found (McKeown et al., 1985)
A PROOF OF CONCEPT
RESEARCH QUESTIONS

1. What is the distribution of semantic clusters in:
   - A. an archival database of words from elementary texts?
   - B. all words in Common-Core compliant core reading programs (Gr. 3)?
   - C. targeted vocabulary of core reading programs (Gr. 3)?

2. Current instruction:
   - 2a: Does the vocabulary targeted for instruction within lessons represent the themes of the texts?
   - 2b: How are teachers guided in teaching target vocabulary in relation to the theme(s) of text selections?

3. What is the nature of the targeted vocabulary of texts within a core reading program when a semantic cluster approach is applied?
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METHOD

■ Question 1a: Marzano & Marzano (1988) database of 7,230 words sorted into 61 superclusters and 12 megaclusters

■ Question 1b & 1c: All of the words in texts as well as vocabulary targeted for instruction in three Grade 3, Common Core-compliant core reading programs:
  – Houghton Mifflin Harcourt Journeys (HMH; Baumann et al., 2014),
  – McGraw-Hill Wonders (MH; August et al., 2014), and
  – Scott Foresman Reading Street (SF; Afflerbach et al., 2013).

■ Questions 2a and b: Texts selected from the middle of:
  ■ Houghton Mifflin Harcourt Journeys (HMH; Baumann et al., 2014),
  ■ Houghton Mifflin Harcourt Into Reading (Ada et al., 2020)

■ Question 3: Marzano & Marzano (1988) database augmented with the addition of 7,410 words in the Word Zone Profiler.
<table>
<thead>
<tr>
<th>Superclusters (Marzano &amp; Marzano, 1988)</th>
<th>Vocabulary Megaduster (Hiebert, 2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feelings/emotion; Attitudinals</td>
<td>EMOTIONS &amp; ATTITUDES</td>
</tr>
<tr>
<td>Communication; Mental actions; Senses/perceptions</td>
<td>COMMUNICATION</td>
</tr>
<tr>
<td>Nonemotional traits; Physical traits of people; Ownership/possession; Popularity/knownness; Life/survival; Conforming/complexity</td>
<td>TRAITS &amp; SOCIAL RELATIONSHIPS OF CHARACTERS</td>
</tr>
<tr>
<td>Occupations; Types of people; Types of groups</td>
<td>CHARACTERS</td>
</tr>
<tr>
<td>Action; Motion</td>
<td>ACTION &amp; MOTION</td>
</tr>
<tr>
<td>Human body; Clothing</td>
<td>HUMAN BODY</td>
</tr>
<tr>
<td>Value/correctness; Similarity/dissimilarity; Cleanliness/uncleanliness; Difficulty/danger; Causality; Size/quantity; Time; Location/direction; Shapes/dimensions; Texture/durability; Color</td>
<td>FEATURES &amp; PHYSICAL ATTRIBUTES OF THINGS/EVENTS/EXPERIENCES</td>
</tr>
<tr>
<td>Places where people live; Dwellings/shelter; Rooms, furnishings; Events</td>
<td>PLACES/EVENTS</td>
</tr>
<tr>
<td>Animals; Foods; Water/liquids; Land/terrain; Vegetation; Soil/metal/rock; Light; Weather; Mathematics; Temperature/fire; Chemicals; Electricity</td>
<td>NATURAL ENVIRONMENT</td>
</tr>
<tr>
<td>Machines/engines/tools; Transportation; Materials</td>
<td>MACHINES</td>
</tr>
<tr>
<td>Literature/writing; Money/finance; Sports/recreation; Language; Entertainment/arts</td>
<td>SOCIAL SYSTEMS</td>
</tr>
<tr>
<td>Pronouns; Contractions; Auxiliary/Helping verbs</td>
<td>FUNCTION WORDS</td>
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Q1a: Distribution of semantic clusters: Archival database of words in elementary texts (Marzano & Marzano, 1988)

- **Green** = concrete categories
- **Blue** = abstract categories
- **Black** = function words

- 54% of words fall into fairly “concrete” categories—characters, natural environment.
- 44% fall into fairly “abstract” categories—features, attitudes;
- 2% consist of function words
Q1b: Semantic Clusters in Common-Core compliant core reading programs (Grade 3)

- Ratio of concrete to abstract is fairly similar to original distribution
- Function words remain the same; however: proper names and variant words (e.g., onomatopoeia) account for 11% of words.
Q1c. Semantic clusters in instructional words in core reading programs

- Substantially more abstract words than concrete words taught
- Within abstract categories, features continue to form the largest category but communication is also substantial
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Q2a: To what degree do targeted words in current core reading programs connect to key concepts? With one another?

Focus Vocabulary (Grade 3.3): HMH Journeys—Common Core (2014)

- examined
- peak
- fondly
- steep
- rugged
- mist
- pausing
- pleaded

• Theme: Why are stories from different cultures important?

- Target texts:
  - Yonder Mountain: A Cherokee legend
  - The Trail of Tears
Q2b: How are teachers guided in instructing target words?
The Best Worst Day

Dr. Mary Fernandez would often think back fondly on the eventful day that set her on the path to becoming a doctor.

When Mary was a young girl, she and her friends had gone hiking. They left early, while a mist still covered the peak of the hill they hoped to climb. The trail was rugged, with many loose rocks and tree roots, but the girls were having a wonderful time.

After staying with the group for a long time, Mary and her friend Jamie started falling behind. They kept pausing to look at the amazing view that would unexpectedly open up between the dense pine trees. Jamie couldn’t help but stop to snap pictures of the interesting things growing near the trail. After stopping to look at an enormous mushroom growing on a rotten log, they looked up and saw that the rest of their friends were far ahead. The girls took off running, but the trail was very steep. Suddenly, Jamie slipped and fell hard. She yelled in pain.

Mary examined Jamie’s leg. Her foot was twisted at a funny angle, and Jamie pleaded with Mary not to move it. Luckily, their friends had missed them and came back to look for them. Since Jamie could not walk, they decided Mary would stay with her while the others went for help.
Q3: What is the nature of the targeted vocabulary of texts within a core reading program when a semantic cluster approach is applied?

Narrative: *Yonder Mountain*
Informational: “The Trail of Tears”
CHEROKEE TALES & TRUE STORIES

PLACES/CONTEXT:

PROPER NAMES

• southeast U.S.
• Georgia
• Mississippi
• Oklahoma
• Trail of Tears [National Historic Trail]

CHARACTERS:

• yonder mountain
• distance
• mountain peak
• steep trail
• homeland

PROPER NAMES

chief
leader
elders
enemies
warriors
settlers
survivor
president
soldiers

Cherokee
Native Americans
Indian
U.S. Army
U.S. national government
PLACES/CONTEXT:

PROPER NAMES
- southeast U.S.
  - Georgia
  - Mississippi
  - Oklahoma
  - Trail of Tears
  [National Historic Trail]

EVENTS/FEATURES
- smoke signals
- journey
- treaty
- Indian Removal Act

CHEROKEE TALES & TRUE STORIES

CHARACTERS:

PROPER NAMES
- Cherokee
- Native Americans
- Indian
- U.S. Army
- U.S. national government

- settlers
- survivor
- president
- soldiers

- yonder mountain
- distance
- mountain peak
- steep trail
- homeland

- chief
- leader
- elders
- enemies
- warriors
Q1a: The Marzano & Marzano framework captures primary semantic clusters of words in elementary texts.

Q1b: The Marzano & Marzano framework does not address proper names and linguistic forms such as abbreviations and onomatopoeia.

Q1c: The words targeted for instruction emphasize words from abstract categories more than from concrete categories (relative to all words in texts).

Q2a: The targeted words do not appear to have been chosen to represent the primary themes/content of a passage. Q2b: Guidance to teachers supports instruction of each word individually and not in relation to one another or the underlying theme or content.

Q3: There does appear to be sufficient grist within current core reading programs to teach vocabulary that develops at least some background knowledge.
SUMMARY

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QUESTIONS & COMMENTS
QUESTIONS

1. Can we ever expect vocabulary instruction/interventions to be reflected in higher levels of comprehension?
   - Wright & Cervetti (2017): “Although this [Beck, Perfetti, & McKeown, 1982] is a promising finding, researchers who employed similar interventions in five more recent studies have not been able to replicate the significant, positive generalized comprehension effects.
## A Tale of Two Studies

Beck, Perfetti, & McKeown (1982)

- accomplice 9e.1
- rival 9g.3
- hermit 9g.4
- tyrant 9g.5
- virtuoso 9L.1
- novice 9L.1
- miser 9m.1
- philanthropist 9m.2

Apthorp, Randel, Cherasaro, Clark, McKeown, & Beck, (2012); similar vocabulary used in Apthorp (2006)

- anonymous 42h.2
- disbanded 33a.3
- crucial 26c.1
- tactic 2g.8
- ingenuity 12k.1
- lodged 2v.7.
- feverishly 5j.3
- formative 54b.4
2. If vocabulary instruction does transfer beyond knowledge of taught words and to generalized comprehension, what topics should be emphasized?
   - What is known about the transfer of “knowing how to learn” through developing some areas of knowledge to other, less direct topics?

3. Do any proper names fit into an ELA vocabulary program?

4. Can large numbers of concrete words be taught with pictures or descriptions?
   - In core reading program: Abstract words (3.7 and lower on a 5-point scale) have an age of acquisition of 7.3, while concrete words have an average of acquisition of 6.5.

5. O’Reilly et al. concluded that “The more predictive words were among the highest topically associated words as reflected by natural-language-processing-based statistics (Deane, 2012).” Would predictions with the concept vocabulary of narratives be as accurate?
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CONCLUDING COMMENT

- A knowledge-based vocabulary program, using the vocabulary in current texts, could be a first step in increasing the attention to knowledge in ELA periods.
- This approach is one that can be readily applied with current tools and frameworks.