

Teacher Created Materials

P U B L I S H I N G

STEM Foundation 1

Academic Language Proficiency



ARKANSAS
DEPARTMENT
OF EDUCATION

Presenter
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STEM Foundation 1: Academic Language Proficiency

“STEM (science, technology, engineering and mathematics) education is an interdisciplinary approach to learning where rigorous academic concepts are coupled with real-world lessons.”

(Arkansas Department of Education)

STEM Foundation 1:

Academic Language Proficiency

Academic Language Proficiency Overview

- Develop a common understanding of academic vocabulary
- Understand a framework for selecting academic vocabulary
- Integrate research-based methods for teaching and developing academic vocabulary across the content areas
- Incorporate strategies that provide students opportunities to learn, apply and practice using academic vocabulary within and across the content areas

Agenda

- Introduction to vocabulary development and instruction
- Introduction to academic vocabulary
- Selecting words to teach
- Strategies for developing academic language proficiency
- Classroom demonstration of STEM subjects highlighting academic vocabulary strategies

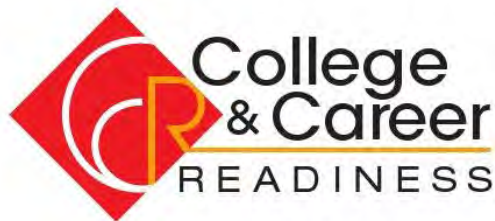
Vocabulary

“A rich vocabulary supports learning about the world, encountering new ideas, and enjoying the beauty of language.”

Beck & McKeown, 2013



Why Do Students Need Academic Language in the 21st Century?



**to compete
in a global
economy**

to achieve in gatekeeper courses



**to
collaborate**



**to communicate
and share ideas
or solutions**

Vocabulary Development

- Incidental Word Learning
 - Reading is the single largest source of vocabulary growth for students.
 - Students' vocabulary grows about 3,000 words a year, 7-10 words a day. (Beck and McKeown, 1991)
 - The role of oral language



Traditional Instruction

- Assign (not teach) word lists
- Utilize vocabulary workbooks



Understanding Vocabulary

- Receptive Vocabulary (Input)
- Expressive Vocabulary (Output)

Mora-Flores, 2011



Input/Output

We understand this definition (input), but we may not use these words when we define or describe it ourselves,(output).

Example:

Astronomy, also frequently referred to as Astrophysics, is the **scientific study** of **celestial objects**, such as **stars**, **planets**, **comets**, and **galaxies** and **phenomena** that originate outside the **Earth's atmosphere** such as the **cosmic background radiation**. (Mora-Flores, 2011)

Academic Vocabulary

- “General Academic Vocabulary” (Baumann & Graves, 2010)
 - Words that are valuable for academic purposes
 - High utility words

Content Vocabulary

- “Domain – specific” content vocabulary (language of the discipline) (Baumann & Graves, 2010)
 - Can be low frequency, but
 - Supports students’ access to the curriculum
 - Aids comprehension

Vocabulary Tiers

- Tier 1: Basic words that rarely require instruction
- Tier 2: High-frequency words for mature language users
 - Importance and utility
 - Instructional potential
 - Conceptual understanding
- Tier 3: Low frequency often limited to specific domains



Tier 1

“Tier One words are the words of everyday speech usually learned in the early grades, albeit not at the same rate by all children. They are not considered a challenge to the average native speaker, though English language learners of any age will have to attend carefully to them. While Tier One words are important, they are not the focus of this discussion.”

(CCSS, 2010, Appendix A, Pg. 33)

Tier 2: Academic Vocabulary

“...(what the Standards refer to as general academic words) are far more likely to appear in written texts than in speech. They appear in all sorts of texts: informational texts and literary texts. Tier Two words often represent subtle or precise ways to say relatively simple things.

“...Because Tier Two words are found across many types of texts, they are highly generalizable.

(CCSS, 2010, Appendix A Pg. 33)

Tier 3

“...(What the Standards refer to as domain-specific words) are specific to a domain or field of study and key to understanding a new concept within a text.

...Because of their specificity and close ties to content knowledge, Tier Three words are far more common in informational texts than in literature.”

(CCSS, 2010, Appendix A Pg. 33)

Introducing New Words

- Activate prior knowledge
- Explicitly teach words
- Model use in context
- Provide opportunities to use words



Model for Vocabulary Development

- Wide reading
- Direct teaching of important individual words
- Teaching word-learning strategies
- Strategies to model, practice and apply vocabulary
- Observe word consciousness



Questions

- What do you see?
- What do you observe?
- What questions do you have?
- What are you interested in learning more about?



Guided Practice: Initiating Inquiry

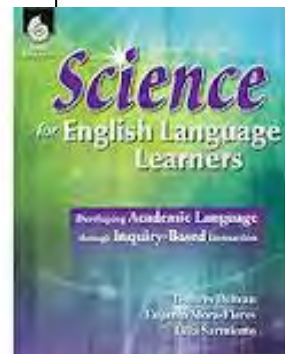
Inquiry Charts/T-Chart

- Recording observations
- Documenting questions

L.K.1d Understand and use question words (interrogatives) (e.g., who, what, where, when, why, how).

NS.1.K.2 Ask questions based on observations.

T-Chart	



Structured Practice

Search-Match-Say

- Students participate in a partnership discussion to initiate the inquiry process



L.K.1d Understand and use question words (interrogatives) (e.g., who, what, where, when, why, how).

L.K.1f Produce and expand complete sentences in shared language activities.

NS.1.K.2 Ask questions based on observations.

Independent Practice

RECASTING

- Academic Vocabulary in context
- Content Vocabulary
- Forms of language

NS.1.K.2 Ask questions based on observations.

L.K.1f Produce and expand complete sentences in shared language activities.)

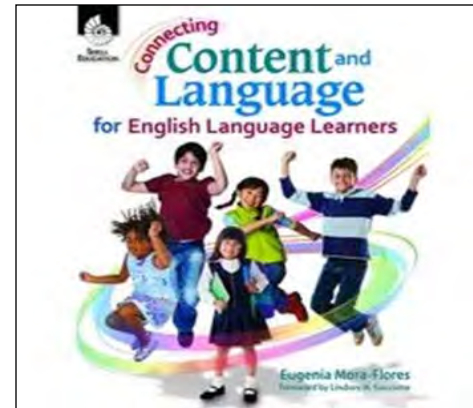
CLOSURE

CLOZE SENTENCE

- Language Models

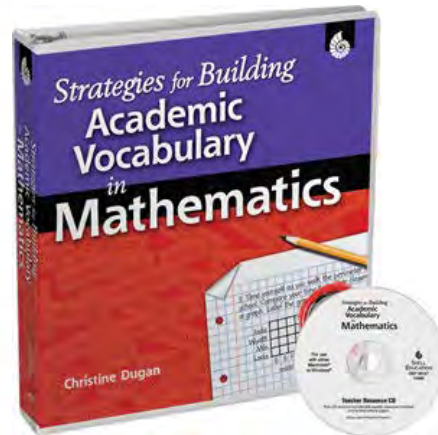
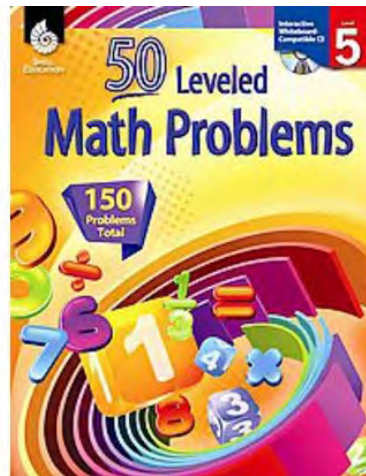


L.K.1f Produce and expand complete sentences in shared language activities.



Building Background

Think Aloud:
Clarifying Content
and Academic
Vocabulary



L.5.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships ...

Guided Practice

Deconstructing Language

- Close reading of word problems

L.5.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships ...

Structured Practice

Partnership work

- Students participate in a partnership discussion to practice core content and lesson objective



5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators

Independent Practice

Written Output

- Academic and Content Vocabulary in context
- Applied practice



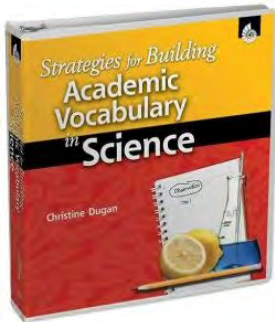
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CLOSURE

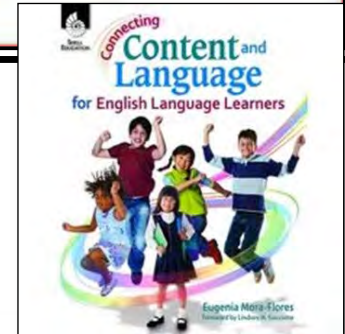
JEOPARDY

- Reviewing Core vocabulary

words
have
power



FINAL CLASSROOM DEBRIEF



Building Background

Knowledge Rating Scale/Word Wall

- Generating prior knowledge
 - Words and concepts
 - Frontloading content and academic vocabulary

RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

Guided Practice and Application

T-Chart

- Integrated learning

Pair Share

- Incidental academic language development

Demonstration

- Performance
- Peer feedback

MF.1.P.11 Apply Newton's Third Law of Motion to explain action-reaction pairs

Independent Practice

Written Reflection

- Written Language accounts



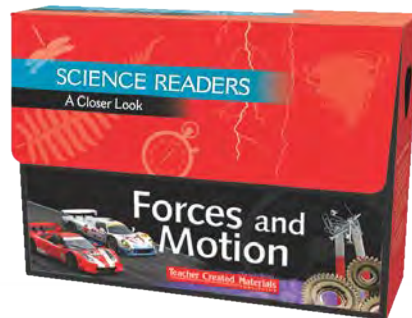
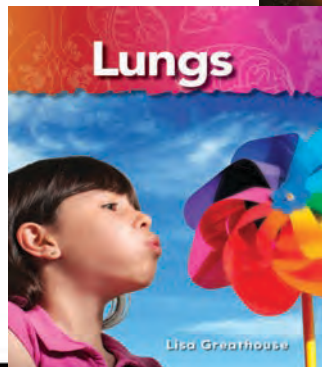
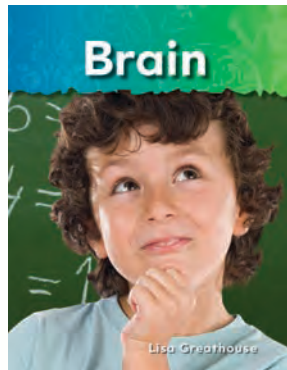
ACE 1.1 Spell, define and pronounce terminology correctly and appropriately
WHST.11-12.10 Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

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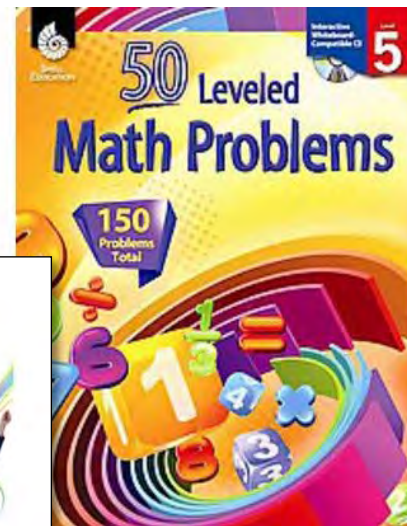
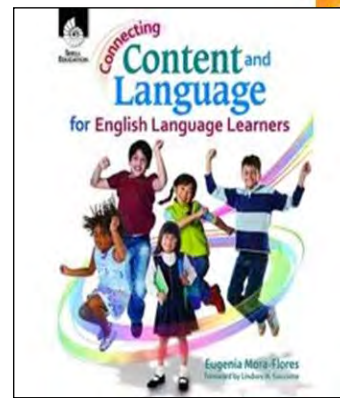
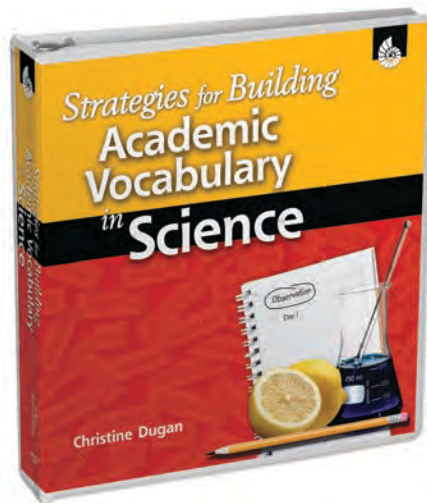
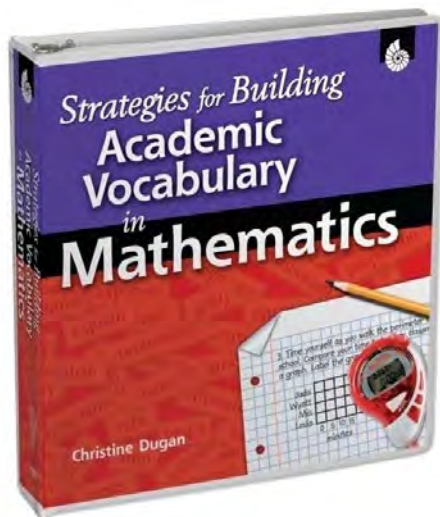
- A family-owned company
- Founded 36 years ago
- Trusted name among PreK–12 educators
- Develops curriculum solutions and professional resources
- Materials have been used in the U.S. and 89 countries



Teacher Created Materials Classroom Resources



Shell Education Professional Resources



Academic Language Proficiency

In Closing...

- Identify possible Tier 2 and Tier 3 vocabulary words for the lesson
- Explicitly teach the words
- Provide opportunities for students to practice using the words