

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

DBER Speaker Series

Discipline-Based Education Research Group

1-13-2014

Science as a Second Language

Stephanie Wessels

University of Nebraska-Lincoln, swessels2@unl.edu

Follow this and additional works at: <http://digitalcommons.unl.edu/dberspeakers>

Wessels, Stephanie, "Science as a Second Language" (2014). *DBER Speaker Series*. 51.
<http://digitalcommons.unl.edu/dberspeakers/51>

This Presentation is brought to you for free and open access by the Discipline-Based Education Research Group at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in DBER Speaker Series by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Abstract for DBER Group Discussion on 2014-02-13

Presenter(s), Department(s):

Dr. Stephanie Wessels
Assistant Professor
Teaching, Learning and Teacher Education
University of Nebraska-Lincoln

Title:

Science as a Second Language

Abstract:

Science classes for English Language Learning (ELL) students can be challenging because they are faced with learning both science content and the English language at the same time. ELL students are less likely to have the vocabulary needed to comprehend informational text, and so instruction that helps build both general academic and content-specific vocabulary knowledge is particularly critical. In this presentation, I will present an overview of research-based teaching strategies that are appropriate for science will be described and their theoretical underpinnings will be discussed.

Attachments after PowerPoint slides:

- (1) blank Dots Evaluation template
- (2) blank Uncover-Connection-Me Evaluation template



Science as a Second Language

Dr. Stephanie Wessels

UNIVERSITY OF
Nebraska
Lincoln

Content Area Reading

- As U.S. schools focus on teaching grade-level content to English language learning students (ELLs), ELLs' reading skills in the content areas is critical, both for successful learning while in ESL, and for a smooth transition to mainstream classrooms.
 - However, ELLs still struggle when reading in the content areas especially science.
- As a content area, science is unforgiving in terms of the constant need to build knowledge and the technical terminology needed to express that knowledge (Bravo, Hiebert, & Pearson, 2007).



Science Vocabulary

- Science presents a language that is very distinctive in itself.
 - Science vocabulary is the most readily identifiable issue in science literacy.
- Words such as *theory*, *fault*, *force* and *wave* take on different meanings from those of everyday English (Powers & Stanfield, 2009).
- As students learn new concepts in science, it is important that they learn new vocabulary to go along with those concepts.



The importance of using “integration of second language development” into science and create appropriate conditions for providing input by:

- Motivate engaged reading (Guthrie et al., 2006)
- Alternate ways for providing input
- Techniques for making subject matter comprehensible
 - Students communicate through nonlinguistic representations (drawings) and linguistic (English and/or native language)
- Opportunities to develop language proficiency for academic purposes
 - Helps students use the discourse of science (Pappas et al., 2004) and deep understanding of science concepts (Palincsar & Magnusson, 2001)



Purposeful Strategies

- Each vocabulary strategy offers students the opportunity to build and extend upon their understandings of a word's meaning and to make personal connections with the science content.
 - Marzano (2004) suggests that vocabulary instruction is most effective when it targets academic terms that students will encounter throughout their reading materials.
- The samples were taken from the district's science for fourth graders.

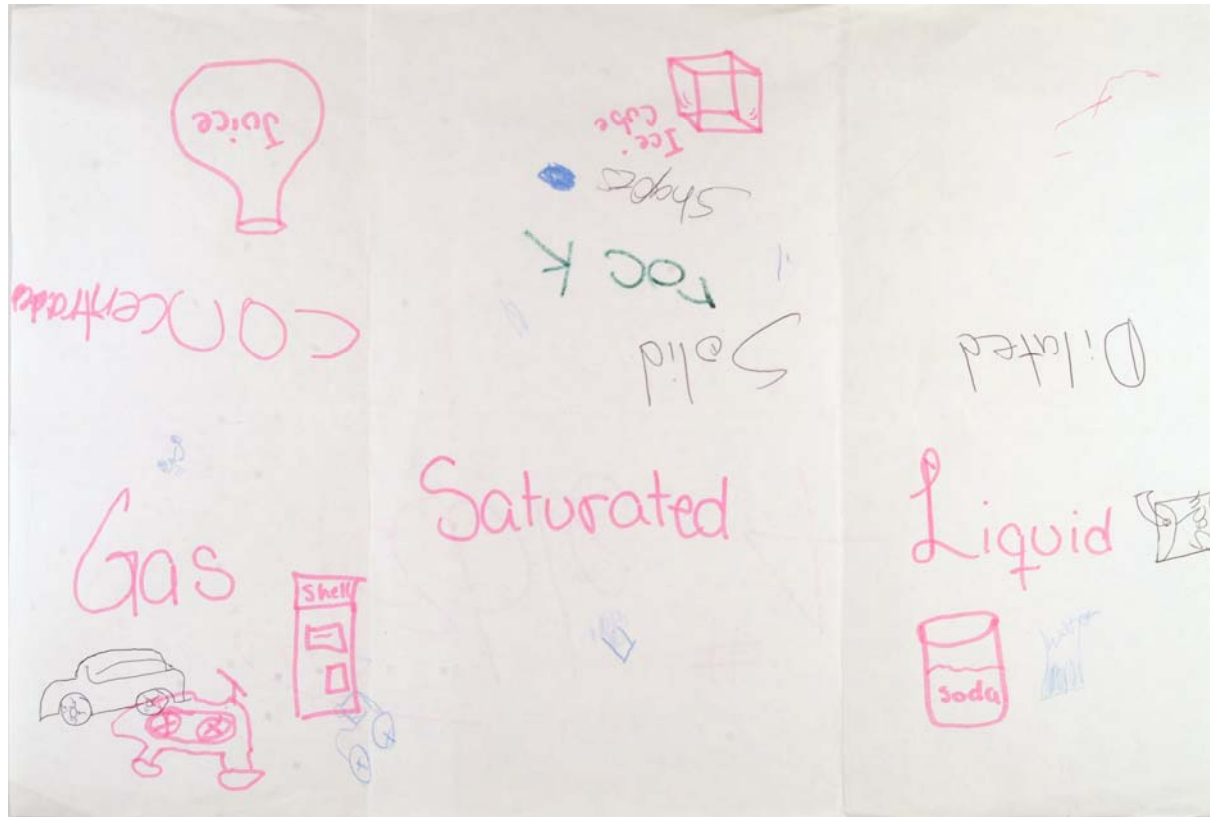


Activating Background Knowledge

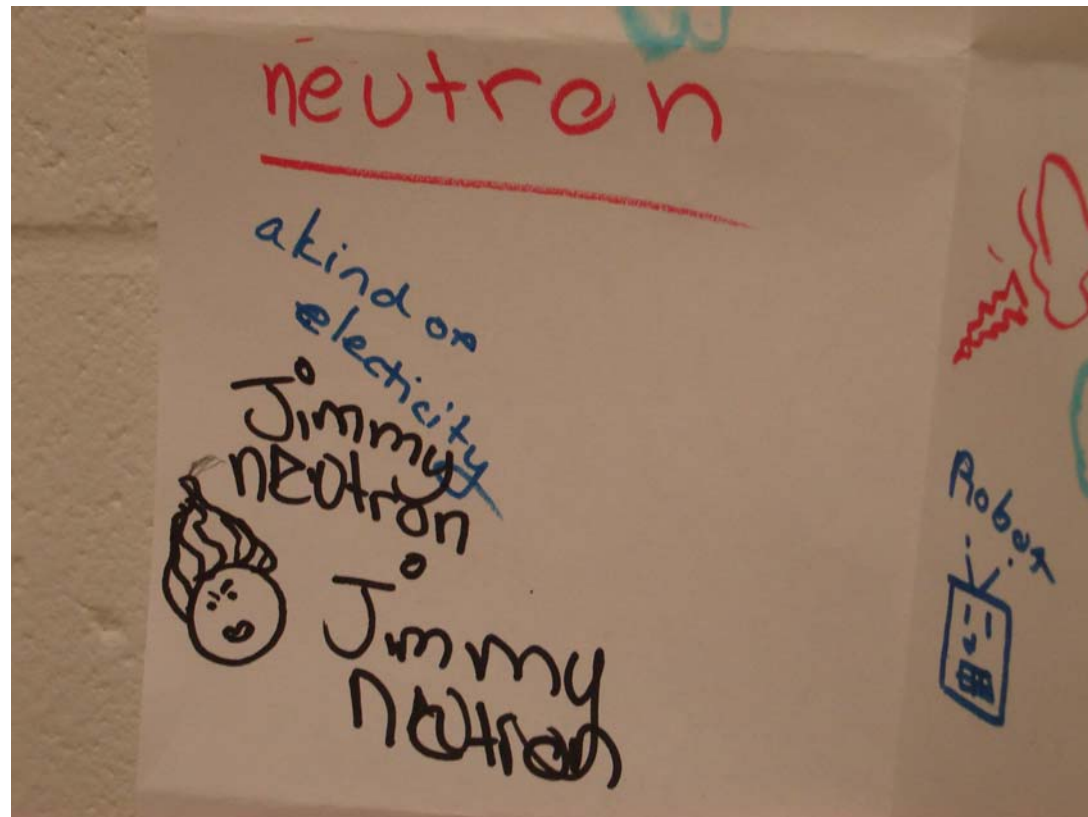
- Background knowledge is what students use to develop, expand, and refine vocabulary word meanings in a specific content area (Rupley, Logan, & Nichols, 1999).
 - ELLs may have difficulty with the English language, however, they bring resources and knowledge experiences that are valuable in the classroom.
 - Discuss associations with the student's activated background knowledge and the science vocabulary words.
 - When students use their experiences and background knowledge to define their understanding of the vocabulary, they understand and remember the words better.



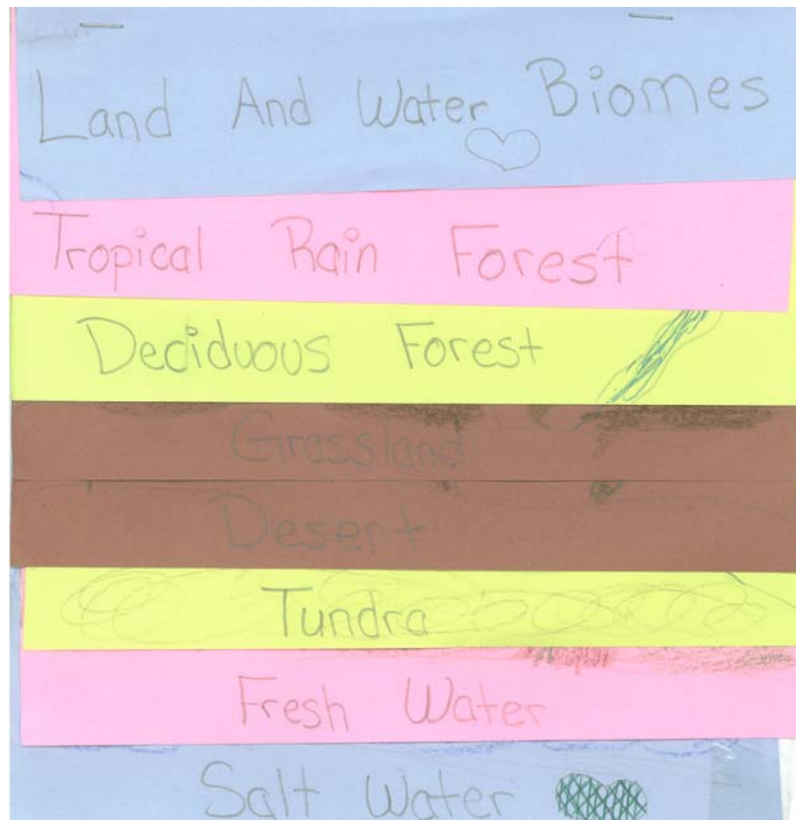
Vocabulary Quilt



Activated Background Knowledge



Vocabulary Foldable: Explanation Phase



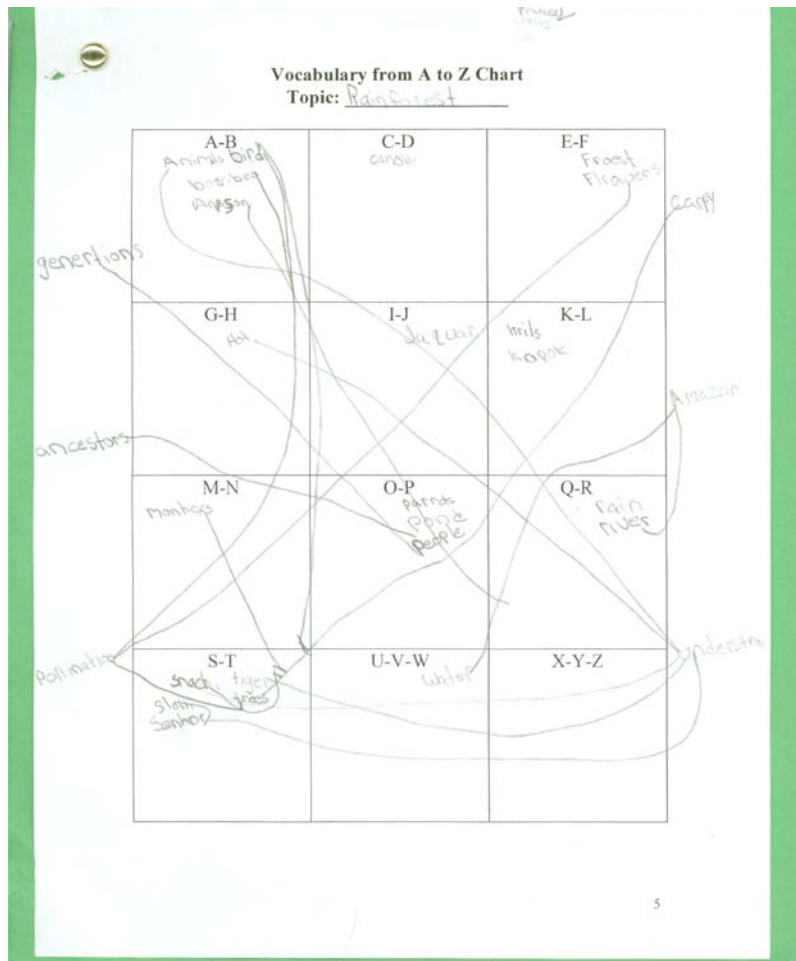
- Students are able to communicate lesson information, concepts and vocabulary.
- Students have a hands-on resource to record information.

Making Connections

- Students should have regular opportunities to connect the science they are experiencing in the classroom to events in their lives to develop rich conceptual understandings (Dumas, 2004).
 - It is helpful to make connections while pointing out important distinctions between a word's general meaning and its meaning within the context of science (Powers & Stanfield, 2009).



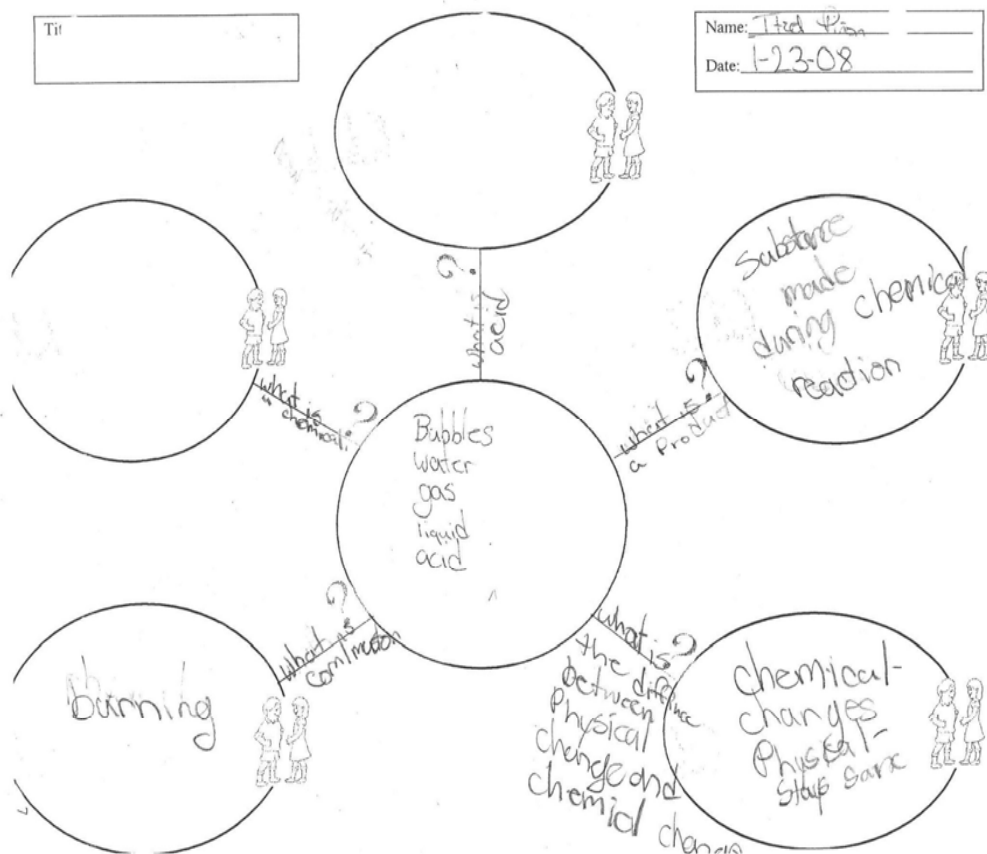
Dots



- Engagement Activity:
 - Students writing information/previous connections
- Explanation:
 - Students wrote key vocabulary
- Elaboration:
 - Connected existing knowledge to new knowledge



U-C-ME: Summarization Tool (Uncover, Connections, ME): Evaluation



Enforcing Science Vocabulary

Researchers found that students learn science better when they write about their thinking and that the act of writing “may force integration of new ideas and relationships with prior knowledge. This forced integration may also provide feedback to the write and encourage personal involvement” with what is being studied (Fellows, 1994).

- Provide students a concrete system to process, reflect on, and integrate information (Arguelles, 2005).



Instruction should:

- At the beginning and conclusion of each lesson:
 - teachers should engage students in linking the activated background knowledge to the newly acquired content knowledge
 - background knowledge is made permanent
 - Make sure students have had multiple exposures to the information
 - Summarize big ideas
- As a result, the students' engagement is higher as well as better retention where the students use the previously learned vocabulary in other educational situations and experiences.





Thank you for listening & Questions
Please feel free to contact me.
swessels2@unl.edu

Slide design © 2007, Board of Regents of the University of Nebraska. All rights reserved.

UNIVERSITY OF
Nebraska
Lincoln

Dots

Topic: _____

A-B	C-D	E-F
G-H	I-J	K-L
M-N	O-P	Q-R
S-T	U-V-W	X-Y-Z

U-C-Me

Name: _____

Date: _____

