

A WINNING COMBINATION

Interactive

word

walls

and

the

language




of

science

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Establishing classroom routines that provide students with the opportunities to learn and successfully apply the language of science is a daunting task. With minor variations, research has shown that effective and comprehensive vocabulary programs share four common elements: they are rich and varied language experiences; they teach well-selected words; they teach word-learning strategies; and they foster word consciousness (Graves 2006; Baumann, Ware, and Edwards 2007; Beck and McKeown 2007). These components can be presented independently. However, powerful learning occurs when they are combined. Interactive word walls are a viable teaching strategy that effectively incorporates the four components of a comprehensive vocabulary program along with a visual foundation

Table 1.**Rubric for word wall artifact creation.**

Required Elements			
Vocabulary Word	The word is included and spelled correctly.	The word is included but I need to check my spelling.	The word is missing.
Definition	The definition is included and correct.	The definition is incomplete/ incorrect.	The definition is missing.
Visual Support (Actual item or picture)	An item or picture is included.	An item or picture is included but incomplete.	An item or picture is not included.
Handwriting	Handwriting is neat, legible, and can be seen from a distance.	Handwriting is neat and legible but cannot be seen from a distance.	Handwriting is not neat, legible, or able to be seen from a distance.

for students to anchor learning. This article describes an effort to build science content understanding and support the language of science by implementing student-generated interactive science word walls in a bilingual elementary school in central Texas.

Building the Word Walls

Many elementary school classrooms use word walls to display vocabulary students have learned in class. Traditional word walls are simply lists of words that are posted in a classroom. This is a good beginning. The teaching potential of word walls increases when student-generated material and visual supports are arranged to illustrate relations between words and concepts to organize learning. The most effective word walls include photographs or the actual item as well as explicit connections between concepts.

To support vocabulary development in science, Husty and Jackson (2008) created interactive word walls that resemble graphic organizers. Interactive word walls visually organize information and help students identify important ideas and see how those ideas fit together.

Interactive word walls are learning timelines that catalogue the accumulated knowledge of a class over time. Student participation in creating and maintaining word walls is crucial. Students generate artifacts for word walls, which usually include a visual support of the word to facilitate real-world connections, a vocabulary label, and a correct definition. The use of actual items, concept maps, student drawings, pictures from magazines, and other text resources turn interactive word walls into student-generated art galleries.

Students participate in rich and varied language expe-

riences when they produce and engage with interactive word walls and associated visual supports in creative and imaginative ways. Third-grade students constructed the word wall elements that are discussed in this article.

Word wall artifacts can be completed either individually or with a partner. This determination should be made by the classroom teacher depending on the nature of the vocabulary word and the content being taught. It is recommended that the majority of the word-wall-building be done in class together; however, students were encouraged to bring items from home after conferring with the teacher if they felt the item would be a better visual support for their artifact. The classroom teacher established clear expectations and parameters regarding word wall construction at the beginning of the school year. These expectations required that all word wall artifacts include the vocabulary word, a correct definition, a visual support, and be written in neat, legible handwriting that was visible from a distance. A rubric could be used to guide and provide students with feedback while creating word wall artifacts (Table 1). Because the teacher only monitored four requirements, students expressed themselves and showcased their understanding of content using a variety of media without undo adult influence or supervision. As with any classroom activity, safety is always a priority. Therefore, when students had completed their contribution to the interactive word wall, the teacher was responsible for hanging it so that there was no risk of injury from falling items. Clear packing tape and pushpins were most effective in securing interactive word walls. There was also careful consideration and guidance when selecting items for display so that nothing potentially dangerous was used.



Figure 1.

Interactive science tool word wall created during a Bag and Tag game.



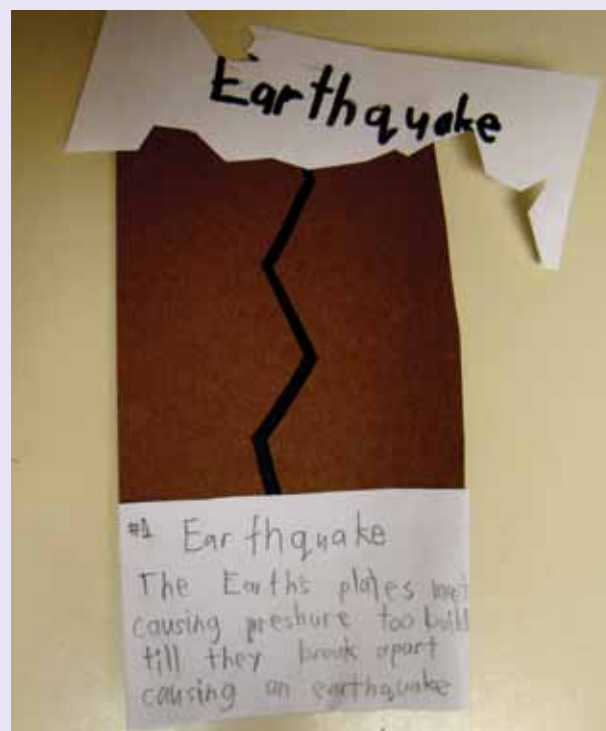
Students quickly took ownership of the word walls. They were proud of their contributions and the word walls became a trusted academic resource. One student used the science word wall because “it has a lot of facts.” Another student liked using the word wall to “learn more words and have fun.” As the school year progressed students gained experience creating interactive word walls and needed minimal support and guidance from the classroom teacher. The students were encouraged to be creative, and the teacher posted a wide variety of student-generated artifacts. This uninhibited expression by the students served as natural differentiation. Students were allowed to express their knowledge and understanding in a manner that best suited their learning style. Students created vocabulary word strips, wrote definitions, illustrated vocabulary, prepared vocabulary graphic organizers, and supplied actual items as appropriate. Word wall construction provided an engaging backdrop for instructional activities and vocabulary games.

Word Wall Games

Figure 1 contains an example of an interactive word wall featuring science tools that was created by playing “Bag and Tag” (Husty and Jackson 2008). Bag and Tag is a fast-paced guessing game. One student gives clues regarding an item enclosed or hidden in a bag. They provide hints regarding the size, shape, color, weight, common use at home, or how it might be used in a science investigation. The rest of the class tries to identify the unseen item. When the item is correctly identified, it is given a label (tag), placed in a sealable bag, and posted on the word

Figure 2.

Student representation of an earthquake.



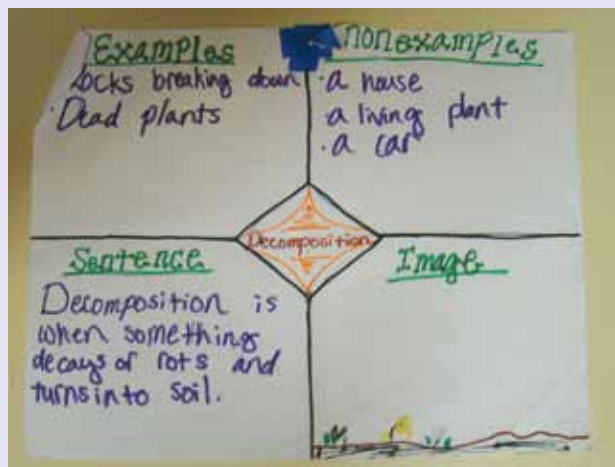
wall. A definition is written on a piece of paper or large index card and posted next to the bag. Associating actual objects as visual supports with vocabulary terms and definitions activates prior knowledge and helps students make important real-world connections. Actual objects are an important feature of the Bag and Tag game and a standard component of interactive word walls.

When actual items were not readily available or logistics made it impossible to post an authentic example, students illustrated the vocabulary word or science concept themselves. Figure 2 shows how one student represented the term *earthquake*. This student used brown and white construction paper and a black marker to create an example of what an earthquake might look like on the Earth's surface. This visual allowed other students to make a concrete connection to the word's meaning and the actual action that results from the phenomena. However, students need to realize that this is a representation of an understanding of an earthquake and note the actual event or result of the event. Having the student explain the rationale behind his or her artifact (and possibly attaching a written explanation) can prevent misconceptions from being formed by classmates who reference it.

Students also used Frayer model vocabulary graphic

Figure 3.

Frayer model for decomposition.



Keywords: Literacy Skill
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organizers (see Internet Resource) to create artifacts for the word wall. Frayer models were created by folding an 8.5 in. × 11 in. piece of paper into four squares and then drawing a circle or a diamond in the middle of the paper. Each vocabulary word was written in the center circle or diamond and the remaining squares were used to display different aspects of the vocabulary word. They usually included an example of the word, a nonexample, use of the word in a sentence to show meaning and understanding, and a drawing. Figure 3 displays a Frayer model for the word *decomposition*. The student provided two examples of *decomposition*, three nonexamples, used decomposition in a sentence, and also included a sketch.

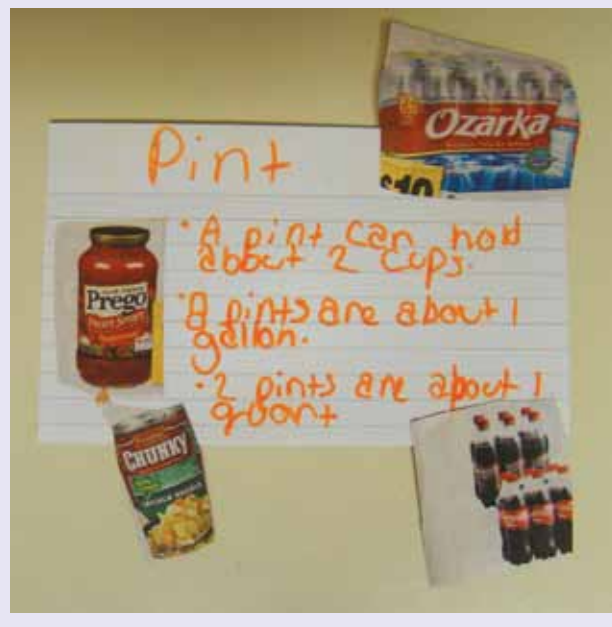
Student Assessments and Perspectives

The interactive science word wall also included student-created drawings and illustrations found in magazines or other print resources. Student-created drawings allowed the teacher to formatively assess vocabulary comprehension. Summative grading is not encouraged because the teacher should formatively assess final products with students prior to posting them on the wall. This will ensure that what is posted contains accurate content for other students to reference. One student drawing designed to demonstrate the meaning of the word “island” included the required definition of the word and a colorful drawing. It also included the word *Hawaii*, demonstrating the students’ effort to make a real-world connection.

Sometimes students used images from magazines, newspapers, or other print sources to represent or help explain the meaning of words. In Figure 4, students used a

Figure 4.

Magazine images of “pint.”



variety of common pictures to demonstrate the word *pint*. These colorful images helped students connect vocabulary to items they interact with every day.

When asked whether the interactive word walls helped them learn science, the students responded affirmatively. Students felt that the word walls helped them find information and remember content they had learned previously. A few students reported that they relied on the word walls to complete summative assignments and daily class work. The students also referred to the word wall when they needed help with spelling because it “told me how to spell the word.” One student commented, “There was a picture or thing that showed what something meant.” Students appreciated that the word wall “shows examples of the words.” Another student stated, “When I was stuck on something, I could look at the word wall to figure it out” and the walls helped them “remember things throughout the year.” Students also liked to see their own work on the word wall. One student stated, “You get to make an example while learning a fact.” The interactive walls provided visual connections that students relied on to recall past concepts and clarify new understandings. One student thought that they were “the perfect thing to help us at school.”

Effective Organizing

Interactive word walls are built to support instruction and they are conceptually organized to explicitly highlight connections. Figure 5 (p. 56) shows an interactive word wall constructed to support a unit about properties of matter. The word wall has a title and key properties of matter

Figure 6.**Multi-unit interactive science word wall.**

Researchers agree that effective comprehensive vocabulary programs should address word consciousness (generate an interest and awareness of words); teach word-learning strategies; teach well-selected words (purposely selected content-related vocabulary to enhance teaching and learning of concepts); and provide rich and varied language experiences. Interactive word walls are instructional tools that help students form relationships with and learn vocabulary through interactive visual literacy while also supporting the Common Core Language Arts standards. “The standards expect that students will grow their vocabularies through a mix of conversations, direct instruction, and reading. The standards will help students determine word meanings, appreciate the nuances of words, and steadily expand their repertoire of words and phrases” (Common Core State Standards Initiative 2012). Along with supporting the Common Core Language Arts standards, word walls help to address the goals of “What It Means to Learn Science” found in *A Framework for K–12 Science Education* by supporting the four strands that “imply that learning science involves learning a system of thought, discourse, and practice—all in an interconnected and social context—to accomplish the goal of working with and understanding scientific ideas” (NRC 2011, p. 252). Overall, interactive word walls provide students with opportunities to interact with vocabulary in a multitude of ways. ■

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Internet Resource

Framer Model

www.readingeducator.com/strategies/frayer.htm

Connecting to the Standards

This article addresses the following National Science Education Standards (NRC 1996):

Teaching Standards**Standard B:**

Teachers of science guide and facilitate learning.

Standard D:

Teachers of science design and manage learning environments that provide students with the time, space, and resources needed for learning science.

Standard E:

Teachers of science develop communities of science learners that reflect the intellectual rigor of scientific inquiry and the attitudes and social values conducive to science learning.

National Research Council (NRC). 1996. *National science education standards*. Washington, DC: National Academies Press.