

INTERACTIVE WORD WALLS

Create a tool to increase science vocabulary in five easy steps.

By Julie Jackson and Rose Narvaez



It is common to see word walls displaying the vocabulary that students have learned in class. Word walls serve as visual scaffolds and are a classroom strategy used to reinforce reading and language arts instruction. Research shows a strong relationship between student word knowledge and academic achievement (Stahl and Fairbanks 1986). As a result, building academic content vocabulary is an important part of science instruction. To support vocabulary development in science, we use interactive science word walls that resemble graphic organizers, strategically target academic vocabulary, and are student generated.

When students were asked to describe how interactive word walls supported their learning, the overwhelming majority of students not only said that they were better than traditional word walls, but many identified ways in which the word walls helped them. For example, one student stated that the word wall “helped me because whenever I forget I could just look back, and it gave me good information.” Additionally, students stated that it “helps remind us of what we have learned” and “since it is always up there I always remember.” This article describes five steps that show how to plan and construct interactive word walls and shares the experiences of fifth-grade teachers at 10 inner-city elementary schools who use interactive word walls to support science instruction.

Traditional word walls (Figure 1) are teacher-generated, unorganized lists of words that are posted on classroom walls. Many are posted at the beginning of the school year and then left alone. As a result, they are not current with instruction and not used or valued by students. Interactive word walls are an effective instructional strategy because they present current academic vocabulary while providing visual representations that help students develop “an understanding of, and fluency in, key unit vocabulary” (Douglas et al. 2006, p. 328). Additionally, word walls that include visuals differentiate instruction for English language learners (Carr, Sexton, and Lagunoff 2007). English language learners often struggle with the academic vocabulary included in technical

readings or expository texts they are exposed to in science classes. Figure 2 (p. 44) contains an example of this type of word wall. The key learning concepts are clearly labeled and organized to support learning. The words *light*, *refract*, and *reflect* are easily viewed from across the room. The folded headings organize the wall and contain definitions. Notice the mix of real items and pictures of everyday objects that reflect and refract light. If the actual items (realia) were available, they were added to the wall. Color pictures were substituted when realia was not available or too big, too valuable, or too heavy to display. Interactive word walls are planned by teachers but created by students during the school day. Participating teachers report that their students “enjoy drawing, writing, and bringing items from home to contribute” to the wall.

Student participation in creating and maintaining interactive word walls is crucial. We ask students to supply the items (realia) and assign finding objects or examples

FIGURE 1.

Traditional word wall.



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for the wall as homework. Students can prepare labels, write definitions, create illustrations, and suggest relevant connections and patterns. The connections that they make are insightful and often surprising. “Ooh! That would be a great thing to add to the wall!” and “Can I make the card?” are typical student responses.

Because we construct these walls during class discussions, we frequently include items and tools from our inquiry science activities. This supports deeper understanding of disciplinary core ideas by providing multiple opportunities for students to contribute and interact with the objects displayed on the word wall while connecting core science concepts, inquiry experiences, scientific tools, and academic vocabulary.

The lesson described in this article applies to the *Next Generation Science Standard* disciplinary core idea Matter and its interactions (5-PS1-3): “Make observations and measurements to identify materials based on their properties” (Achieve Inc. 2013, p. 38; see Internet Resources).

Building a Word Wall

Step 1: Planning the Word Wall

Determine Vocabulary Needs

Purposeful planning provides opportunities to plan instructional activities that focus on core science ideas, performance expectations, and vocabulary with fidelity—all while heeding district guidelines. It also provides time to understand the grade band endpoints vertically, answering the questions of what has been taught, what needs to be taught, and what will be taught in future grades. We look closely at our grade level disciplinary core concepts and performance expectation verbs in order to understand the depth of knowledge, rigor, and intent of the standard and to identify essential vocabulary. We also identify crosscutting concepts, looking for ideas and practices that cut across all of the science disciplines.

First we distinguish between familiar (prior knowledge) and new vocabulary. We determine familiar vocabulary

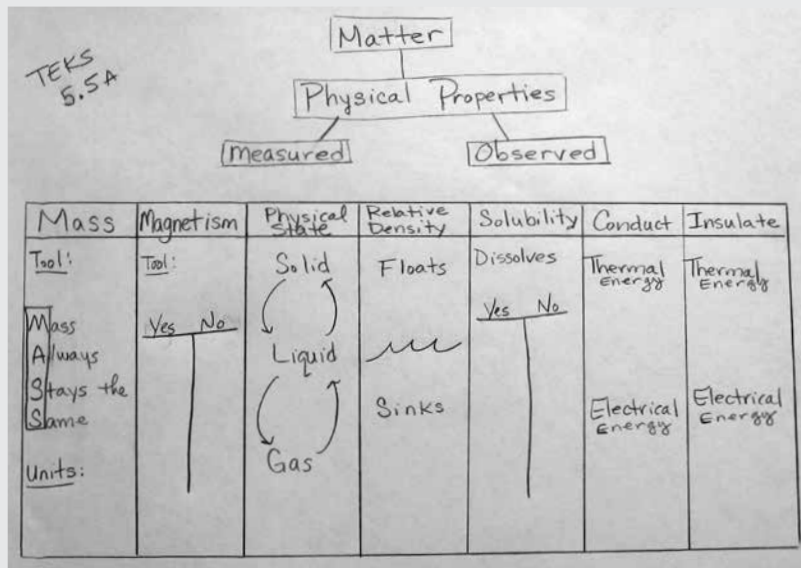
by looking at the previous grade level science standards. Vocabulary words that students learned in prior grades and may have forgotten are considered familiar vocabulary, and they will be direct taught. Sometimes we include these terms on the word wall under the heading “Words You Know.” New vocabulary is introduced through inquiry and targeted during classroom explanations and discussion and posted on the word wall. Next, we identify multiple meaning words, affixes, and root words related to the core science standard. Since many science terms have Latin origins, we also look for Spanish-English cognates. These will be introduced in context and included on the wall. Then, we determine target vocabulary related to the core science standard and plan ways to support these words during instruction. The vocabulary choices should be flexible and allow for additional words that emerge during instruction. We also look for crosscutting patterns and connections that we can use to structure or frame our word walls.

The next step is to pair selected words with pictures or real objects. We like to use real objects when possible. If the real items are not available, we use pictures or photographs. These do not need to be elaborate. Their purpose is to help students (especially those who are ELLs) make quick and easy visual connections to vocabulary.

FIGURE 2.

Light unit interactive word wall.



FIGURE 3.**Physical properties word wall sketch.****Sketch a Concept Map**

Once target vocabulary and phrases are identified and matched with pictures or realia, we sketch a concept map to organize content and connect the vocabulary. To determine the best way to represent the information, we ask ourselves about the nature of the content: Does the concept have a hierarchical structure that can be divided into categories and subcategories? Is this concept a cycle? Do students need to compare and contrast topics? Explore cause and effect? Examine structure and function? Recognize scale, proportion, and quantity? Classifying matter by physical properties will require students to compare and contrast information.

Patterns and connections related to the science standard determine the concept map or framework used to structure the word wall. For example, flow maps easily illustrate the flow of energy in a food chain, while a web concept map may be used to represent the flow of energy in food webs. Some core science concepts lend themselves to circle maps, continuum/time lines, tree maps, or T-charts. A tree map sketch of an interactive word wall is shown in Figure 3. Photos of interactive science word walls are available at the Science Toolkit Facebook page, and the Achievement Strategies, Inc. website (see Internet Resources) contains a nice list of graphic organizer templates (see Internet Resources).

Completed sketches become blueprints for the word walls. This process organizes information within a unit,

just as a graphic organizer would. The classroom word wall functions as a unit organizer that students can easily reference to help them organize content and support vocabulary development as the unit progresses. Students even encourage each other to “look at the wall, the answer is there.” Teachers use the walls, too. “Once I get my wall up, I find myself referring back to it to tie concepts together or to review.”

Step 2: Create a Student Worksheet

After we identify vocabulary and sketch the interactive word wall, we prepare a student worksheet that mirrors our sketch. Students are given copies of the organizer worksheet that they complete as the word wall is constructed during the unit. Figure 4 (p. 46) contains a student organizer for the fifth-grade Texas science standard

“classify matter based on physical properties” (TEKS 5.5A) which supports part of NGSS standard 5-PSI-3 “Make observations and measurements to identify materials based on their physical properties” (Achieve Inc. 2013, p. 38).

Step 3: Place the Word Wall

Once we have selected vocabulary, have an idea of how specific concepts are linked, sketched the word wall, and prepared the student organizer worksheet, we are ready to place the word wall frame in our classrooms (Figure 5, p. 47). Wall space and room arrangements often determine the configuration and placement of word walls. They may be arranged on cupboard or classroom doors, on classroom walls, on windows, or hung from the ceiling with wire. Maximum instructional potential and efficiency is achieved when interactive word wall construction is aligned with lessons and students are allowed to participate in the construction process. As a result, walls are usually built across many days and are finished as a unit nears completion.

Step 4: Build the Wall in Class

Once the word wall is placed, we are ready to build the wall with our students. We like to plan and structure instruction around the construction of the word wall. We strategically introduce target vocabulary and highlight connections to previously established words or concepts during instruction. Each column of the properties of matter interactive

FIGURE 4.

Physical property student organizer/activity sheet.

Matter

Anything that has _____ and takes up _____.

Physical Properties

Mass	Magnetism	Physical State	Relative Density	Solubility	Conduct	Insulate
Tool: Units: The ____ of the amount of _____ in an object.	Tool: Magnetic Not Magnetic	Solid Liquid Gas	F_____ in water S_____ in water	Dis_____ves Does _____ dissolve	Energy through Thermal energy example Electrical energy example	_____ the flow of _____. Thermal energy example Electrical energy example

word wall (see Figure 6, p. 48) is completed during lesson discussions or following experiments that cover individual physical properties. For example, once students have planned and carried out investigations to determine which objects are magnetic or not magnetic, they add the items to the Magnetism column under the proper heading “is magnetic” or “not magnetic.” This process is repeated for physical state (solid, liquid, gas), solubility, relative density, insulator, and conductor. To support classroom management, students are permitted to add items as directed by their teachers during discussions and explanations. Interactive word walls might appear cluttered or messy to visitors but not to students who were present as each section was built. Because students participated in building the word wall, they take great pride in sharing them with

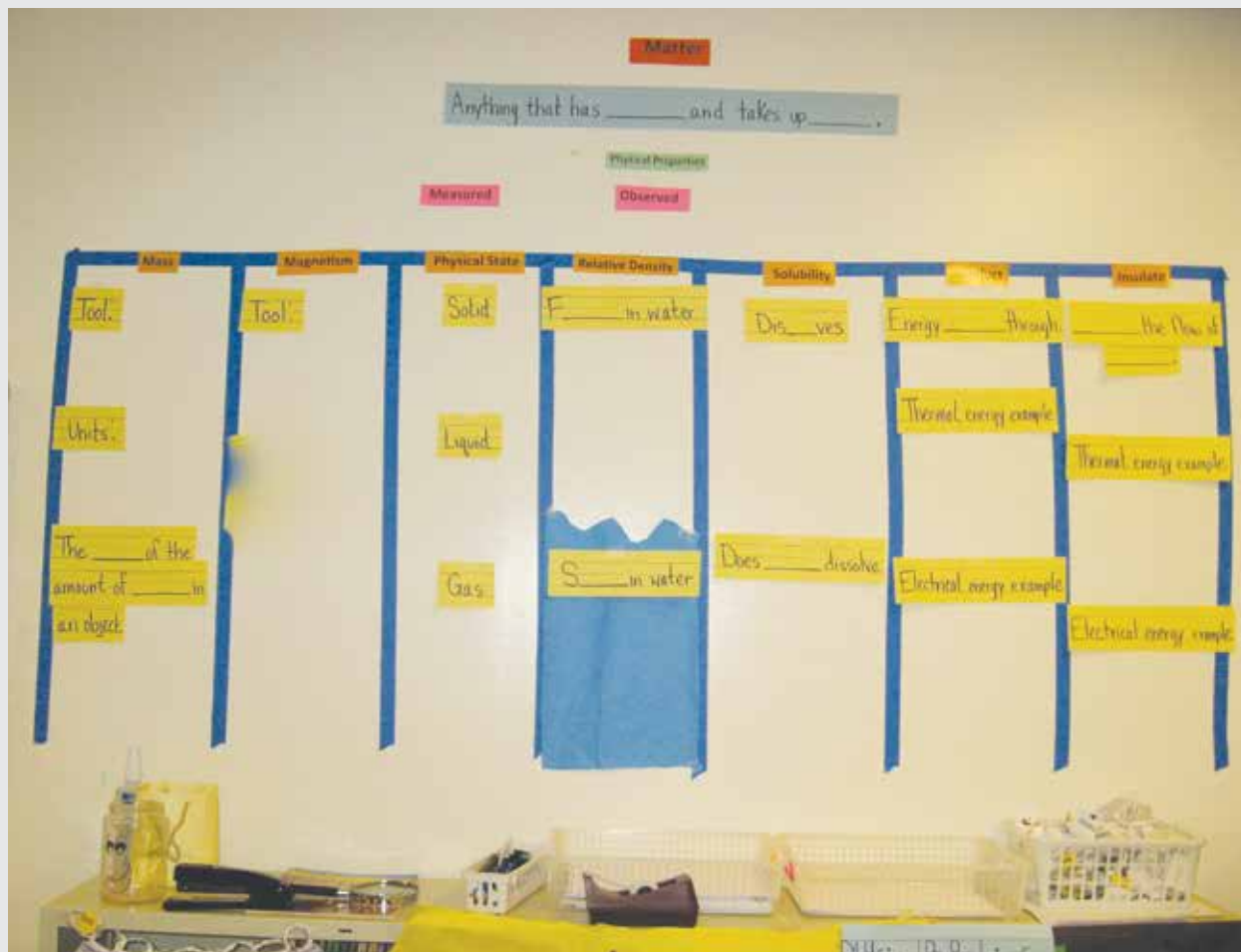
others. When asked to explain their word walls, students eagerly share what elements they contributed and explain the inquiry experience that the wall represents. At the end of a unit they frequently ask, “What’s going on the next wall? Can we make it?” A teacher stated, “I find that my students are taking more ownership of their learning when they help create the word wall and see the direct application of knowledge and information.”

Step 5: Complete Student Record Sheet and Word Wall Together

Student organizer worksheets mirror the word wall. As the word wall sections are completed, students fill in corresponding sections of their organizer. As a result, the students have a copy of the word wall in their possession.

FIGURE 5.

Physical property interactive word wall frame.



These sheets track daily instruction and may be used as formative assessments. Teachers may need to adjust instruction after looking at student organizers and noticing that students have not recorded information correctly, have confused concepts, or included inappropriate examples. Students usually glue the organizers into their science notebooks at the beginning of a unit. We like to take photographs of completed word walls and give copies of the photos to the students to glue into their notebooks at the end of their unit notes. This creates visual bookends of the learning experience. Additionally, a photo helps us remember how we organized the walls and eases the planning burden year to year.

The following sections introduce a word wall rubric that we share with teachers who want to improve their current word walls or who wonder if their initial attempts to create interactive word walls meet expectations. Ad-

ditionally, we describe challenges that teachers have encountered and provide solutions that might help others faced with similar constraints.

Good, Better, Best Word Walls

A good, better, best rubric (Jackson, Tripp, and Cox 2011) that we use to guide word wall construction and structure teacher reflection is shown in Figure 7 (p. 49). It can be used to determine if word walls are interactive. Administrators use it during school tours to help them determine if word walls are good (traditional) or best (truly interactive and student generated). This rubric outlines the steps needed to transform a traditional word wall, which is generally a list of words, into a powerful interactive teaching tool that involves students, organizes content, and better supports learning. Interactive word walls that are rated

“Best” are current with instruction, include words that are visible from a distance, are arranged to illustrate relationships and organize learning, are student generated, and contain visual supports.

Challenges and Solutions

The most challenging part of the interactive word wall process is finding time to plan and sketch the concept map. Early release and planning days provide extra time that we use to plan and sketch unit word walls. Also, making the word wall interactive for students can be logistically difficult. Putting the walls in locations that allow easy access helps students use the walls and add items for display or reference vocabulary and definitions. Deciding when and how to rotate word walls is also challenging. Wall space is a factor in most classrooms, making it difficult to display multiple word walls simultaneously. We recommend leaving the walls up as long as possible. Once we have finished using the walls we move them into the hall. Teach-

ers sometimes build their boards on trifold science fair boards or chart paper to facilitate moving them. Having the necessary supplies is also a challenge. Students, parents and other teachers have been quick to respond to our requests for supplies, and a local grocery store provided small denomination gift cards that we have used to purchase items found in their store. Finally, certain science topics are easier to work with than others. However, given these challenges, we believe it is well worth the effort and make time to plan and implement interactive science word walls. Why? Identifying and defining terms does not deepen understanding if students do not understand connections between concepts.

Conclusion

Interactive word walls are an effective teaching strategy (Jackson and Ash 2011; Jackson, Tripp, and Cox 2011). They support the development of scientific thinking; build academic vocabulary; and reinforce important pat-

FIGURE 6.

Completed physical property interactive word wall.



FIGURE 7.**Interactive word wall rubric.**

Good: Academic vocabulary is posted. Words are aligned with current instruction. Words are visible from a distance.

Better: Academic vocabulary is posted. Words are aligned with current instruction. Words are visible from a distance. Words are arranged to organize learning. May contain student-generated material. Visual supports are black-line masters or cartoons.

Best: Academic vocabulary is posted. Words are aligned with current instruction. Words are visible from a distance. Words are arranged to organize learning. Contains student-generated material. Visual supports are color pictures, photographs or the actual item (realia).

GOOD	BETTER	BEST
Academic vocabulary is posted	Academic vocabulary is posted	Academic vocabulary is posted
Aligned with current instruction	Aligned with current instruction	Aligned with current instruction
Words are visible from a distance	Words are visible from a distance	Words are visible from a distance
	Words are arranged to organize learning	Words are arranged to organize learning
	May contain student-generated material	Contains student-generated material or can be used by students
	Visual supports are black-line masters/pictures or cartoons.	Visual supports are color pictures, photographs or the actual item (realia).

terns while providing an overview of each lesson, and upon completion, an overview of the unit as well. Interactive word walls are useful to students not only in unifying related terms and concepts, but also in helping students visualize connections between vocabulary, inquiry experiments, their own interests, and experiences. ■

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References

- Achieve Inc. 2013. *Next generation science standards*. www.nextgenscience.org/next-generation-science-standards.
- Carr, J., U. Sexton, and R. Lagunoff. 2007. *Making science accessible to English learners: A guide for teachers*. San Francisco, CA: WestEd.
- Douglas, R., M. Klentschy, K. Worth, and W. Binder. 2006. *Linking science and literacy in the K–8 classroom*. Arlington, VA: NSTA Press.

Graves, M.F. 2006. *The vocabulary book: Learning and instruction*. New York: Teachers College Press.

Jackson, J., and G. Ash. 2011. Science achievement for all: Improving science performance and closing achievement gaps. *Journal of Science Teacher Education* 23 (7): 723–744.

Jackson, J., S. Tripp, and K. Cox. 2011. Interactive word walls: Transforming content vocabulary instruction. *Science Scope* 35 (3): 45–49.

Stahl, S.A., and M.M. Fairbanks. 1986. The effects of vocabulary instruction: A model based meta-analysis. *Review of Educational Research* 56 (1): 71–110.

Internet Resources

- Achievement Strategies, Inc.
www.achievementstrategies.org/graphOrgTemplates.html
- NGSS Table: 5-PS1 Matter and Its Interactions
www.nextgenscience.org/5ps1-matter-interactions
- Science Toolkit Facebook page
www.facebook.com/pages/Science-Toolkit/336549323099512