

HATS  
OFF TO  
SCIENCE

**Students bring vocabulary to life by creating science-themed hats for a fifth-grade parade.**

*By Julie K. Jackson and Nancy Newell*

**W**ords are the foundation of knowledge. They are powerful tools used to express ideas, communicate with others, access knowledge, and learn about new concepts. Research shows a strong relationship between student word knowledge and academic achievement. As a result, building academic content vocabulary is an important part of science instruction. Research also suggests that using visuals in teaching improves student success. Visual literacy, “the ability to interpret images as well as to generate images for communicating ideas and concepts” (Stokes 2001, p. 1), is a key feature of 21st-century classrooms.

The report *Preparing Teachers* (NRC 2010) noted that there is a link between standards and the nature of classroom instruction: “Instruction throughout K–12 education is likely to develop science proficiency if it provides students with opportunities for a range of scientific activities and scientific thinking.” Additionally, *A Framework for K–12 Science Education* states that students learn and demonstrate proficiency with core ideas by engaging in knowledge-building practices (NRC 2011). Vocabulary instruction research states that teachers should provide structured opportunities for students to encounter and use new words in authentic and engaging ways (David 2010). We believe that “vocabulary parades” are a creative, structured, and engaging way to build science content knowledge and demonstrate understanding and thinking.

## Introducing the Parade

The vocabulary parade is an innovative instructional strategy that creatively combines vocabulary instruction and visual literacy. A vocabulary parade provides students with an opportunity to creatively interpret words using costumes, props, posters, or hats. Inspired by the “words-turned-costume” parade presented in Debra Frasier’s delightful book *Miss Alaineus: A Vocabulary Disaster* (2007), we organized our own science vocabulary parade. Science vocabulary parades can be modified to fit the needs of students in both the upper- and lower-elementary school grade levels (K–6).

Debra Frasier’s web page (see Internet Resources) provides detailed instructions on how to organize and stage three types of vocabulary parades: vocabulary in full costumes, vocabulary posters, and hats decorated to represent vocabulary words. Cardboard boxes, file folders, or construction paper could also be used. After reading the three parade descriptions, the fifth-grade team decided that a “Hats-Off-to-Science” vocabulary parade would be the best choice for our students. To ensure the success of each student, we provided inexpensive plastic top hats, supplied decorating materials, and created the hats during the school day.

“Tomorrow is science vocabulary word day! Every-

body picks their science vocabulary word tomorrow!” we exclaimed at our early morning assembly and continued to chant throughout the day. Building anticipation was paramount for student buy-in. The following day, the school literacy coach visited each fifth-grade classroom. She introduced the Hats-Off-to-Science vocabulary parade idea and showed the students pictures of vocabulary parade hats on Debra Frasier’s web page. Then she allowed the students to select a science vocabulary word from a top hat loaded with 90 strips of paper, on which we had written carefully selected words and corresponding pictures representing key fifth-grade science concepts. The literacy coach held the top hat high in the air, and one by one the students put a hand in it and withdrew a word. Then each student read the selected word aloud while classmates cheered and applauded. Once all the students had selected a word, we told them that they were going to go to the library for a review of effective research techniques. There they would be given the time to research their vocabulary word—to find a definition of it and detailed information they could use to represent their word visually. The students were encouraged to think of the black plastic top hats as blank canvases awaiting creative and imaginative vocabulary interpretations.

## Researching the Vocabulary

Since we are always looking for ways to integrate reading, writing, and science, we invited our head librarian into the fifth-grade science circle the next day. Our librarians are trained in a research process called the “Big6” which students can use to gather information (Samuels 2004). Big6 is a six-stage information literacy process that structures the way students seek, use, and assemble relevant, credible information (see Internet Resources for more information). The librarian visited each fifth-grade class and gave a 30-minute overview of the Big6 (see Table 1, p. 48).

The next day, each class trekked to the library to research their words. They identified and selected available resources that they could use to help them understand the meaning and illustrate their assigned words. We encouraged the students to use multiple resources, including encyclopedias, trade books, magazines, and appropriate internet sites. Once the students had located the resources, they extracted relevant information. They then organized and presented the collected information in a written summary.

Written summaries were assessed based on scientific accuracy and application of the Big6. To provide students with opportunities to hear and use the assigned vocabulary words in oral conversations, and to deepen their understanding of the scientific content, we divided them into groups of four and they shared their word and research

**Table 1.****Big6 Basics.**

Skill #1	What is my current task and what are some topics or questions I need to answer? What information will I need?
Skill #2	What are all the possible sources to check? What are the best sources of information for this task?
Skill #3	Where can I find these sources? Where can I find the information in the source?
Skill #4	What information do I expect to find in this source? What information from the source is useful?
Skill #5	How will I organize my information? How should I present the information?
Skill #6	Did I do what was required? Did I complete each of the Big6 stages effectively?

results within these small groups. Finally, the students used the results of their research to create a sketch of how they planned to design their vocabulary parade hats (see Figure 1). As a minimum, hats needed to include the vocabulary word and a visual representation of the word. Definitions were optional but encouraged. Teachers briefly discussed proposed designs with each student to ensure that the content was correct and to clarify how the student planned to use the available materials to illustrate their vocabulary word. Artistic expression was allowed. However, students needed to be able to explain what each element they included represented and how they were related or supported their vocabulary word.

### Bringing Science Vocabulary to Life

We gathered decorating materials from a variety of sources. Two weeks before the parade we sent an e-mail to the school faculty and staff requesting the donation of leftover craft and art supplies. One week before the parade, a letter was sent home with the fifth graders explaining the vocabulary parade and requesting materials (see NSTA Connection for the letter). The response was

overwhelming; our donation boxes were quickly filled with feathers, pom-poms, foam letters, glitter, chenille stems, silk vines and flowers, latex balloons, fabric remnants, buttons, cotton balls, and felt scraps in various colors. Table 2 includes a list of craft materials and art supplies that we collected.

The day of the parade students were given 2.5 hours to decorate their vocabulary hats. Of this block of time on Friday morning, 1 hour was from time allotted for science, 1 hour from specials time (e.g., art and music), and the remaining 30 minutes were a combination of time allotted for homeroom and language arts. You can alter the amount of time spent decorating to best fit your schedule. A 2.5-hour block of time worked best for our school. The students were focused and worked diligently to complete their hats in a timely manner. They chatted as they worked, sharing rationales for their design decisions, and complementing one another on the choice and use of materials and supplies. A combination of traditional glue and glue from hot and low-temperature glue guns were used to attach material to the hats.

Adult supervision is required when working

**Figure 1.**

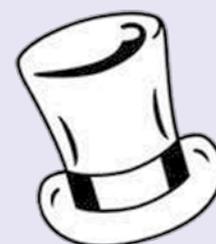
### “Hats Off to Science” planning template.

My science vocabulary word is: \_\_\_\_\_

This word means: \_\_\_\_\_

My decorating plan includes: \_\_\_\_\_

Materials that I will need: \_\_\_\_\_



**Table 2.****Craft materials and art supplies.**

Feathers	Chenille stems	Balloons	Glitter
Curling ribbon	Styrofoam balls	Pom-poms	Straws
Foam stick-on letters	Construction paper	Buttons	Yarn
White school glue	Felt	Small plastic toys	Sandpaper
Silk flowers	Sequins	Cotton balls	Toilet paper rolls
Clay	Cloth ribbon	Beads	Packing tape
Hot and low-temperature glue and glue guns (with adult supervision)	Crepe paper	Fabric	Popsicle sticks
Aluminum foil	Wrapping paper	Markers	Puff paint

with hot glue guns and low-temperature glue guns. The completed hats are powerful examples of how visual images may be used to support academic vocabulary instruction. Each hat was formatively assessed for accuracy before and during construction. Students were not graded on their final products. The hats showcase the way students can transform static vocabulary words into dynamic, 3-D, visual representations (see Figure 2 and Figure 3, p. 50). Figure 2 shows a hat that illustrates boiling point. This hat was covered in blue paper to represent water. The student used blue yarn to mark the boiling point of water, 100°C. Elevated blue pom-poms represent water vapor and steam. The feathers and glitter were decorative accents. Figure 3 contains a hat that illustrates the term *decomposer*. The student noted that decomposers break down dead things (plants and animals) and gave the bunny angel wings and a halo to represent death. The mushrooms (fungi) are the decomposers.

### Let the Show Begin: The Parade

Now that the students had finished decorating their hats, they were prepared for the Hats-Off-to-Science vocabulary parade. The parade took place at the end of that school day. Teachers in grades K–4 prepared their students for the vocabulary parade by explaining that the fifth-grade students had been assigned vocabulary words and then decorated hats to represent the words. Of course, buddy classes were already familiar with the concept and some of the words as they had been exposed to them earlier in the week. Parade participants grouped themselves by the science concept their hat represented—safety, Earth science, life science, or physical science. Students in grades K–4 sat in the hall outside their classrooms as the fifth graders cheerfully paraded by, wearing their hats and waving. We recommend that parade participants walk

slowly so that people watching the parade have a chance to fully experience each hat (costume). It is helpful if students carry a word strip with their vocabulary word written on it. It was difficult for the younger students, who were sitting on the ground, to see and read all of the words on the hats. Following the parade, the hats were strategically displayed throughout the school.

During science instruction, students and teachers referenced the hats when discussing science vocabulary. “That’s my word, I made that hat” was a commonly repeated phrase. The Hats-Off-to-Science activity anchors science vocabulary instruction by providing visually stimulating representations that are student-generated and valued.

**Figure 2.**

### Boiling point vocabulary hat.



PHOTOGRAPHS COURTESY OF THE AUTHORS

**Figure 3.**

### Decomposer vocabulary hat.



We then asked the students to describe their favorite part of the Hats-Off-to-Science vocabulary parade activity and to tell us what part of the process provided the best opportunity to learn about science vocabulary words. The students stated overwhelmingly in the post-vocabulary parade surveys (see NSTA Connection) that they enjoyed creating their hats and participating in the parade. “My favorite part was when I got to design my own hat”; “I liked making the hat because I could use my imagination”; and “My favorite part was making the hats because we got to talk and help each other. It was really fun,” were just a few student comments. In referring to the parade, “I liked showing my hat to everyone in my school” was a common statement. One student wrote, “My favorite part was high-five-ing all the kids during the parade because it made me feel special.” Another student commented, I liked the “parade because you get to show the whole school your hard work.” Most students agreed that researching their word in the library provided them with the best opportunity to learn more about science vocabulary.

We asked the students to provide suggestions regarding what we could do to improve the vocabulary parade. One student wanted “bigger hats so I could decorate more.” Another said that he wanted to “get a tee-shirt and paint it with his vocabulary word to match his hat.” Many students wanted to have another parade and a few wanted harder words.

## Presenting the Science Vocabulary

We wanted to provide students multiple experiences with presenting their science vocabulary hats and added giving speeches to extend this learning activity. One of our state language arts standards expects students to “speak clearly and to the point, using the conventions of language...Students are expected to give organized presentations, employing eye contact, speaking rate, volume, enunciation, natural gestures, and conventions of language to communicate ideas effectively” (Texas Education Agency 2010).

Initially, students presented their vocabulary hats to their classmates. We also wanted ALL of the students to be exposed to ALL of the science vocabulary words. To that end, we created a Hats-Off-to-Science forum in the library several days after the vocabulary parade. This gave the students the opportunity to present their hats to all three fifth-grade classes and to publicly discuss their topic. We pulled the library tables to the side of the room to create a hat display (see Figure 4) and brought in enough chairs for all the students. We used a podium and a microphone, so even our soft-speaking students could be heard.

They were quick presentations, but effective ones. Each student presented their hat, defined their science vocabulary word, and explained why they created their hat as they did. To support English language learners, we provided sentence stems (e.g., “My hat is about...”; “My science word is.... It means...”; and “I included a ... on my hat because...”).

We also provided a forum note-taking organizer that students in the audience completed during the group presentation. The organizer was divided into three columns. The first column was labeled “science vocabulary word,” the second column provided space for a definition, and the third column was reserved for sketches or memory clues. Finally, the fifth-grade students presented their hats and science vocabulary words to their primary-grade buddy classes. It is our hope that the younger students now look forward to being fifth graders and their own Hats-Off-to-Science forum and parade.

Although the announcement of the forum received a cautious welcome, the students quickly conquered their reservations. One student stated that she enjoyed “presenting my hat to the other students so everyone could learn something new” and another student said that “discussing the hats with others was so fun.” Several students reported that during the forum they learned a lot of information that was really interesting.

## Conclusion

Vocabulary parades provide an opportunity to visually display and interpret vocabulary. Visual literacy requires

**Figure 4.**

Vocabulary hats on display in the school library.



students to find meaning in images. This is accomplished when each student creates their own hat and again when they are exposed to their classmates' hats. Vocabulary instruction research states that students should be able to explain the "meaning of words along with thought-provoking, playful, and interactive follow-up" (Beck, McKeown, and Kucan 2002, p. 2). Vocabulary parades meet these criteria. They are thought-provoking and playful while providing students with rich vocabulary experiences that visually showcase a few well-chosen and important science vocabulary words. They are a fun way to be serious about science vocabulary. ■

*Julie K. Jackson* (julie\_jackson@txstate.edu) is an associate professor in the Curriculum and Instruction Department, Texas State University, in San Marcos, Texas. *Nancy Newell* (nancy.newell@pflugervilleisd.net) is an instructional coach at Copperfield Elementary School in Pflugerville Independent School District, Pflugerville, Texas.

### References

- Beck, I.L., M.G. McKeown, and L. Kucan. 2002. *Bringing words to life*. New York: Guilford Press.
- David, J.L. 2010. Closing the Vocabulary Gap. *Educational Leadership* 67 (6): 85–86.

- Frasier, D. 2007. *Miss Alaineus: A vocabulary disaster*. Boston, MA: Sandpiper.
- Graves, M.F. 2006. *The vocabulary book: Learning and instruction*. New York: Teachers College Press.
- National Research Council (NRC). 2010. *Preparing teachers: Building evidence for sound policy*. Washington, DC: National Academies Press.
- National Research Council (NRC). 2011. *A framework for K–12 science education: Practices, crosscutting concepts, and core ideas*. Washington, DC: National Academies Press.
- Samuels, H. 2004. *CRLS research guide: The Big6 Skills™*. Cambridge Rindge and Latin School. [www.crlsresearchguide.org/Big\\_Six\\_Steps.asp](http://www.crlsresearchguide.org/Big_Six_Steps.asp)
- Stokes, S. 2001. Visual literacy in teaching and learning: A literature perspective. *Electronic Journal for the Integration of Technology in Education* 1 (1). <http://ejite.isu.edu/Volume1No1/Stokes.html>
- Texas Education Agency. 2010. Chapter 110. Texas Essential Knowledge and Skills for English Language Arts and Reading: Subchapter A. Elementary. Texas Education Agency. [ritter.tea.state.tx.us/rules/tac/chapter110/ch110a.html](http://ritter.tea.state.tx.us/rules/tac/chapter110/ch110a.html).

### Internet Resources

- Debra Frasier's web page  
[www.debrafrasier.com/pages/gallery.html](http://www.debrafrasier.com/pages/gallery.html)
- The Big6 research method  
<http://big6.com>

### Connecting to the Standards

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

#### Teaching Standard B:

Teachers of science guide and facilitate learning

#### Teaching Standard D:

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

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

### NSTA Connection

For a sample letter to parents, the forum note-taking organizer, and the post-vocabulary parade survey, visit [www.nsta.org/SC1211](http://www.nsta.org/SC1211).

