

Taking the Time to Read Aloud

by Patricia Braun

Teaching science in middle school is fraught with challenges. The textbooks are dense with unfamiliar concepts, the vocabulary unique and difficult, and the students reticent to talk about the text (Fang 2006). Often, the teacher does not have the necessary hands-on materials, and has no supplementary texts in the classroom. Because there is so much to cover in the curriculum, every minute in class is valuable (Abell and Lederman 2007). So, how can reading aloud to middle school students be a valuable use of time?

Several teachers in our school sought the answer to this question by reading aloud to middle school science students. I read about the physics of roller coasters, superheroes, basketball, and airplanes as part of my doctoral study on vocabulary acquisition in eighth-grade science classes. The science teacher, Linda, supported this study by volunteering six of her science classes. Another teacher, Amy, read about life science and Earth science to her sixth graders. When we read, students listened. This was our opportunity to share our excitement and interest in the world of science. The readings introduced scientific concepts, tied those concepts to the world, and exposed students to the vocabulary of the discipline.

Research base for read-alouds

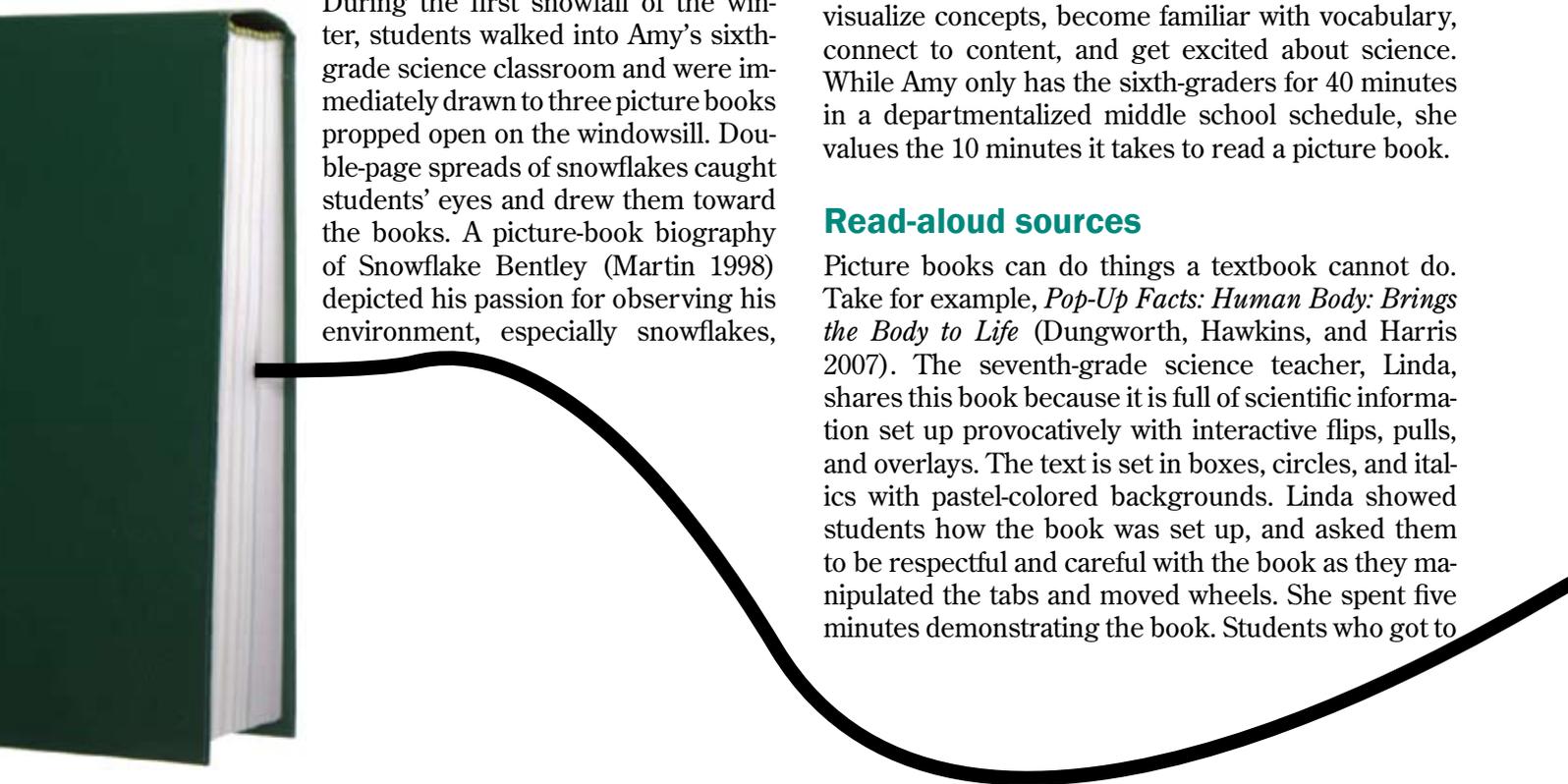
Reading aloud is a widely accepted and successful practice in elementary school class-



rooms, but is rarely found in middle school classrooms (Allen 2000). However, results from initial research on reading aloud in secondary classrooms support the practice (Ivey and Fisher 2006). The benefits of reading aloud are many, but two benefits are particularly valuable in science classes: motivation and vocabulary acquisition (Richardson 2000; Beck, McKeown, and Omanson 1987; Jenkins, Stein, and Wysocki 1984; Nagy, Herman, and Anderson 1985; Robb 2003). More specific research is needed in the area of reading aloud in content-area classrooms. In order to expand read-aloud research to reading aloud in middle schools, I carried out a study in the eighth-grade science classes.

Hearing words multiple times and from varied sources supports vocabulary acquisition (Nagy, Herman, and Anderson 1985; Stahl 2003). As a sixth-grade teacher, I was especially excited about reading aloud to middle school students because of the exposure to the scientific vocabulary. “The more places students see the vocabulary, and the more times they hear the vocabulary, the better they understand the vocabulary” is a mantra of the sixth-grade science teacher. In addition, I use read-alouds as an introduction to units or as a hook to get students’ attention.

Classroom example of a read-aloud



During the first snowfall of the winter, students walked into Amy’s sixth-grade science classroom and were immediately drawn to three picture books propped open on the windowsill. Double-page spreads of snowflakes caught students’ eyes and drew them toward the books. A picture-book biography of Snowflake Bentley (Martin 1998) depicted his passion for observing his environment, especially snowflakes,

and included copies of his black-and-white snowflake photos. *The Story of Snow: The Science of Winter’s Wonder* (Cassino and Nelson 2009) was opened to magnified color photographs of snowflakes. The open pages of *Amazing Weather* (Maisner 2006) connected directly to the lesson on the formation of storms. Students started talking about the shapes and patterns of the snowflakes on the glossy pages of the books. This was before the bell rang. Once the bell rang and students were seated, ready for class to begin, Amy read the book about Bentley. All eyes were on her and the picture book because students knew that this teacher only picked the best books to share with them. What looks like a book for young children was definitely appropriate for the middle school classroom. The story made science seem important and exciting. Sidebars added factual information to the literary text. Amy compared the color photos of snowflakes from *The Story of Snow: the Science of Winter’s Wonder* to Bentley’s black-and-white photos. Amy chose to read these deceptively simple books to older students because, as she says, “It takes a lot of skill to condense scientific facts and concepts into 32 pages of text and pictures.” These texts are not the sole sources of the science curriculum. Amy selected them because they exemplified advances in science technology, highlighted scientists’ lives, and connected to the concepts in the unit on weather. Picture books serve to help students visualize concepts, become familiar with vocabulary, connect to content, and get excited about science. While Amy only has the sixth-graders for 40 minutes in a departmentalized middle school schedule, she values the 10 minutes it takes to read a picture book.

Read-aloud sources

Picture books can do things a textbook cannot do. Take for example, *Pop-Up Facts: Human Body: Brings the Body to Life* (Dungworth, Hawkins, and Harris 2007). The seventh-grade science teacher, Linda, shares this book because it is full of scientific information set up provocatively with interactive flips, pulls, and overlays. The text is set in boxes, circles, and italics with pastel-colored backgrounds. Linda showed students how the book was set up, and asked them to be respectful and careful with the book as they manipulated the tabs and moved wheels. She spent five minutes demonstrating the book. Students who got to

class early explored the book and shared what they learned during discussions about the heart, muscles, skin, skeleton, or brain. There are sources of annotated picture books that focus on content-area concepts such as *Reading Aloud Across the Curriculum* by Laminack and Wadsworth (2006).

Picture books are not the only sources for science read-alouds. Bill Bryson's *A Short History of Nearly Everything* (2003) has so many well-explained concepts connected to the science curriculum that Amy just had to share it with students, even if only for a few minutes once or twice a week. Her copy of the paperback book is dog-eared, filled with sticky notes, and on her desk. She reads from it so often that her students are sure Bill Bryson is her very best friend. When kids see their teacher's passion about a subject, they get excited, too.

Another author science teachers need to know about is *New York Times* best-selling writer Natalie Angier. In *The Canon: A Whirligig Tour of the Beautiful Basics of Science* (2007), she writes with cultural references and analogies that make sense and are short, clever, and titillate the imagination. She destroys the conception that science is "a calcified set of facts and laws" (p. 29) by writing to engage the reader. In trying to get the reader to think quantitatively, she asks, "How many people would have to hold hands to form a human chain around the globe, and how many of them will be bobbing in the ocean and had better bring a life jacket, shark repellent, and a copy of their dental records just in case?" (p. 29). She is a science writer, not a lab scientist, and her mission is to bring science to the forefront by connecting it to life in an easy and engaging manner. Short sections of her book make great read-alouds for science classes.

Science teachers can affect student attitudes toward science (Fouts and Myers 1992) by enthusiastically reading aloud to their classes. Reading from the biographies of both male and female scientists can show how interesting and engaging science can be. *Jefferson and Science* (Bedini 2002) and *The Wilderness Warrior: Theodore Roosevelt and the Crusade for America* by Douglas Brinkley (2009) are books a teacher might read outside of class, but reading snippets of the books to students can educate them about the important figures in history who influenced science education.

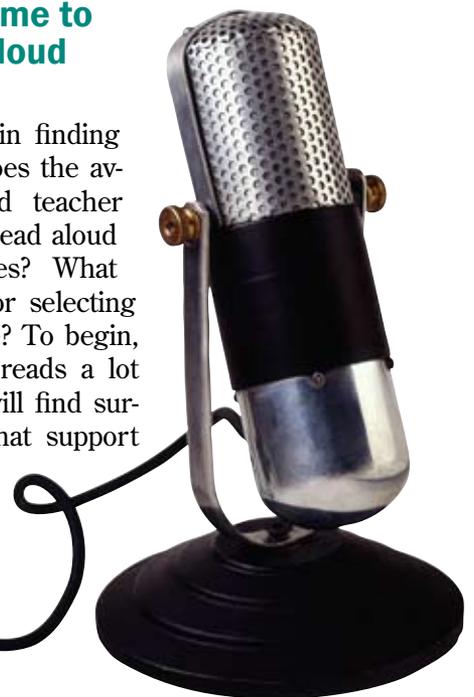
Avenging Agnodice: The Struggles and Successes of Female Scientists, Antiquity to Present by Nancy L. Swanson (2005) includes fascinating statistics about female scientists. For short read-alouds, choose from *Every Other Thursday: Stories and Strategies From Successful Women Scientists* by Ellen Daniell (2008).

To promote science careers for young girls, Jane Kurtz created Lanie, an American Girl character who wants to explore the world, try experiments, and keep facts in her science journal (2010). Women's roles in science are changing, and girls will become more interested when teachers read from sources that include women. In her novel *The Evolution of Calpurnia Tate*, a new young-adult author, Jacqueline Kelly (2009), explores the attitudes of a young girl in the 18th century as she observes the natural world with her grandfather, who is a scientist, while her mother insists on developing her domestic skills.

The internet proves to be a quick source for read-aloud materials. The following sites have both kid appeal and teacher usefulness. Science News for Kids is geared toward students ages 9 to 14. It includes a list of science topics on the home page with links to interesting articles. Jokes and Science is a site for finding attention-grabbing jokes and information. *Physicsworld.com*, a website from the Institute of Physics, highlights news about worldwide events from a physics perspective. These sites are easy to access and engaging for students (see Online read-aloud sources).

Finding the time to locate read-aloud materials

Time is a factor in finding materials. How does the average overworked teacher find materials to read aloud to science classes? What are the criteria for selecting materials to share? To begin, the teacher who reads a lot outside of class will find surprising sources that support



the curriculum. *Chicago Tribune* writer Tom Skilling produces a comprehensive student weather page (see Online read-aloud sources). Some news events and advertisements are connected to science and contain scientific vocabulary. Comic strips often use vocabulary in a humorous way by capitalizing on the multiple meanings of words. Librarians keep up with current publications and will find books for the busy teacher. Don't neglect science journals, which are filled with ideas, plans, comics, information to share with students, and resources. Regardless of the source, the selections should be connected to the content of study, filled with science vocabulary, and interesting to students, as well as to the teacher. It is important, and cements understanding, when students see and hear science vocabulary in places other than their textbooks.

Read-aloud formats

While simple read-alouds with no discussion are efficient ways to focus on a topic, get students' attention, and relate science concepts to life, the best read-aloud formats are interactive. Here are several strategies generally known to elementary reading and writing specialists to use when engaging students through read-alouds:

- *Pair-shares and quick-shares*—After reading a short piece of text that relates to the curricular concepts, tell students to turn to a partner and discuss how the read-aloud connects to the science curriculum. After a short discussion, ask one person from each pair to share with the whole class. In quick-share, ask each student to name one way the read-aloud connects to the curriculum. Remind them to name it, not explain it.
- *Illustrations*—Direct students to quickly draw and label what they remember and understand from the read-aloud. This can be done at the end of the read-aloud, or at specific stopping points of a longer read-aloud. The drawings can be shared in small groups to stimulate conversation about the topic, or they can be used as assessments to determine what students remember and understand, or do not understand, from the read-aloud.
- *Two-word strategy* (Hoyt 2010)—After the read-aloud, direct students to write two words that connect to the main ideas they just heard. After deciding on the two words, they can either write one or two sentences explaining the connections, or turn to a partner and verbally explain the connections.
- *Brainstorm*—Students write their own list of words and phrases connected to the topic. They share their list with a partner, adding to the list as they are reminded of more words during the discussion, and arranging the words and phrases into poems.
- *And the answer is*—Give students answers to which they write questions. For example, from *Snowflake Bentley*, the answer is “detailed photographs of snowflakes.” Students write the question, “What process did Bentley develop?”

These are just a few interactive read-aloud strategies that we have adapted from our work with reading and writing specialists. Additional ideas for interactive strategies can be found in *Content-Area Writing: Every Teacher's Guide* by Daniels, Zemelman, and Steineke (2007), *Writing and Reading Across the Curriculum* by Behrens and Rosen (2010), and *Read It Aloud! Using Literature in the Secondary Content Classroom* by Richardson (2000). The interactive read-aloud strategies are short, simple, and require no elaborate assessment. Yet the teacher can easily see if students are interested and learning. The more actively involved students are, the more vocabulary they will acquire.

Conclusion

Taking 5 to 10 minutes of time to read aloud in science classes once a week helps focus students, supports their vocabulary acquisition, and serves as motivation. When the teacher is animated, looks directly at students, uses materials that are rich in vocabulary, talks to students before class starts, and relates difficult scientific concepts to the world, students can feel a personal connection to the teacher and will become more motivated while increasing their vocabulary. ■

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Read-aloud sources for physics and other sciences

- Blickenstaff, J.C. 2008. The physics of vampire baseball. Arlington, VA: NSTA Reports. December 11.
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Read-aloud resources for biography

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General read-aloud resources

- Angier, N. 2007. *The canon: A whirligig tour of the beautiful basics of science*. New York: Houghton Mifflin.
- Bryson, B. 2003. *A short history of nearly everything*. New York: Broadway Books.
- Kurtz, J. 2010. *Lanie*. Middleton, WI: American Girl.

Online read-aloud sources

- Jokes and Science: Science trivia—www.juliantrubin.com/sciencetrivia.html
- Physics of roller coasters—<http://cec.chebucto.org/Co-Phys.html>
- Physicsworld.com—<http://physicsworld.com>
- Science news for kids—www.sciencenewsforkids.org
- Ask Tom Why weather page—www.chicagoweathercenter.com/news/asktomwhy

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Estimate the reading time for you! The calculation based on standard reading speed. A brainchild of Tharique Azeez.Â Please enter/paste your text to estimate the reading time. The ones who are crazy enough to think they can change the world, are the ones that do. ~ Steve Jobs. Estimate Reading Time! Reset. Support Read-o-meter Buy me a cup of coffee. Â© Read-o-Meter 2010-2015 : A brainchild of Tharique Azeez @ Niram.org Labs. **Calculation is based on the average reading speed that around 200 words per minute (wpm).