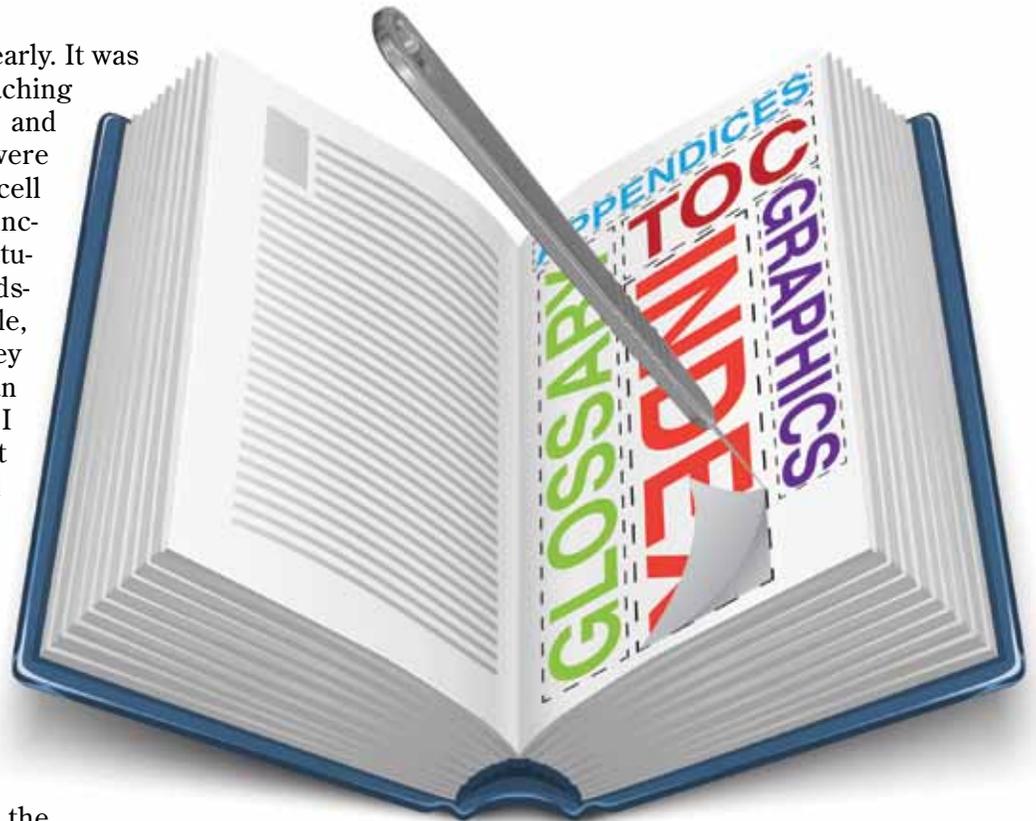


Helping students navigate nonfiction text: Paving the way toward understanding

by *Jannette Moehlman*

I remember the class clearly. It was my second year of teaching seventh-grade science, and my students and I were about to begin a unit on cell organelles and their functions. Although I wanted students to have as many hands-on experiences as possible, there came a time when they need more information than a lab could provide. As I asked students to pull out their textbooks, I heard a collective groan, but I was determined to remain positive. I put on my brightest smile, began explaining the project, and made sure students understood the purpose for reading and what type of information we were looking for. We read the first paragraph together, and I modeled summarizing the important information and adding it to the brightly colored, foldable flaps in students' lab notebooks. Students read the next paragraph as a group, and when we stopped to review, students seemed to have all the right information. I assumed they were ready to begin on their own.

But as I circulated around the room, it soon became clear that the majority of students had not understood a great deal of what they had read on their own or as a group. Many were not able to find information that did not appear in bold lettering or that was explained in diagrams or captions. In fact, most were surprised there was even anything important there. I began to think that maybe they just weren't into the topic, so



I began a pep talk about all the great things we were going to do during the unit. As I spoke, one brave soul raised her hand and made a statement that was met with heartfelt agreement from several other students in the room: “No offense,” she said, “but it’s not that we don’t want to learn about cells, it’s just that we hate reading. It’s hard!”

While seeking help from veteran teachers at my school, I learned that mine was not an isolated problem. In fact, it seemed most teachers accepted that students did not enjoy reading textbooks or were just not very good at it. Some believed students were lazy, while others thought we weren’t teaching our students to outline and gather information like teachers used to.

We all recognized that students were struggling with content-area reading, but we were either unsure of what steps to take to correct the problem or unhappy with whatever methods we'd tried.

I turned to my school's reading specialist, Ranae Hofer, for ideas on how to integrate reading comprehension strategies into everyday instruction. Over time and through our work together, I began to see the root of the problem. I had been so busy concentrating on my science instruction and content that I had neglected to teach content-area reading. I expected my students to enter my classroom as readers and assumed they would know how to effectively apply the literacy strategies and tools we were using. Once I saw my role in the science classroom as a teacher of both science and reading, I began to see improvement. This shift in teaching mind-set will be especially important as states begin to adopt the Common Core State Standards, which include standards for literacy in science and technical subjects (CCSSO and NGA 2010). In addition, the first drafts of the Next Generation Science Standards (Achieve 2012) have also been linked to the Common Core standards. We are no longer teachers of science alone.

Reading in the content areas

Students generally learn to read using narrative, or story-like, texts (Akhondi, Malayeri, and Samad 2011). As they progress into upper-level elementary grades, more of their reading is done in nonfiction, and they begin to make a shift from learning to read to reading to learn. At the middle school level, learning from a textbook is usually crucial to students' success (Guthrie and Klauda 2012). Unfortunately, most middle-level students have had limited exposure to expository text and may not have been taught comprehension strategies within the genre (National Institute for Literacy 2007). This means that as middle school science teachers, we cannot assume students enter our classrooms with the skills necessary to successfully navigate and make meaning from nonfiction texts.

Effective teachers provide students with the opportunity to learn and practice literacy strategies as part of regular classroom instruction (Stephens and Brown 2000). Successful readers are those who know and use a variety of reading strategies as they grapple with nonfiction text (National In-

stitute for Literacy 2007). Students are more likely to remain on task when they are actively engaged with a text (Harvey and Goudvis 2005). Using reading strategies such as questioning, predicting, and summarizing important information can increase student understanding of science texts (Ulusoy and Dedeoglu 2011). However, simply arming students with a strategy they can use to tackle texts is not enough. To be effective, a reading strategy must be modeled and practiced repeatedly before it can be mastered. What follows are some of the strategies and methods I've found to be particularly effective in my own classroom (see Figure 1).

Understanding text features

Before I can teach students to gather information, determine the importance of information found in a text, or find supporting details, they need explicit instruction in identifying the unique features and structures they will encounter as they read expository text. Students who understand these features are better equipped to navigate their way through and comprehend the material. Before students crack open their textbooks for the first time, we have a discussion about the various signs we come across on a daily basis, such as road or exit signs, and what information and understanding we can gain from these signs. We then browse through our textbooks to look for whatever signs we can find there. As we discuss what we've found, we create an anchor chart, a large list we hang on the wall and use as a resource throughout the year, of the following text features:

- Print features (bold print, highlighted terms, headings, subheadings, etc.)
- Table of contents
- Index
- Glossary
- Pronunciation guide
- Appendices
- Graphic aides (maps, graphs, photographs, illustrations, etc.)

The most important element of this activity is the class discussion we have about how each of the features can enhance understanding of the text. For example, students talk about the difference between a photo and

FIGURE 1

Reading strategies

Strategy	Goal and explanation	Common Core Reading Standards for Literacy in Science and Technical Subjects 6–8 (CCSSO and NGA 2010)
Understanding text features	<p>Goal: To help students become aware of text features and how they work together to help us understand text.</p> <ul style="list-style-type: none"> • Discuss the various signs that students come across in their daily lives and have a discussion about what information these signs give us. • Explore the text and look for “signposts”: <ul style="list-style-type: none"> * Print features (bold print, highlighted terms, headings, subheadings, etc.) * Table of contents * Index * Glossary * Pronunciation guide * Appendices * Graphic aides (maps, graphs, photographs, illustrations, etc.) • Discuss how those text features help us understand the text or the topic we are studying. 	<p>Craft and Structure</p> <p>5. Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the understanding of a topic.</p>
Monitoring understanding	<p>Goal: To help students become more aware of their thinking as they read.</p> <ul style="list-style-type: none"> • Share your thoughts about a piece of text in a shared reading experience. Model making connections, questioning the text, and what to do if a particular section is confusing. • Ask students to read a paragraph or small section of text and then stop at the end to share their thoughts with a partner. • Ask students to make note of points in the text that are confusing or that they have questions about. • Have students annotate text as a way to make their thinking visible. 	<p>Range of Reading and Level of Text Complexity</p> <p>10. By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.</p>

an illustration and when each might be more appropriate than the other.

Monitoring understanding

The next step in students’ development as readers of nonfiction is to help them become more aware of their thinking as they read. Successful readers continuously think about and interact with text as they read

and stop periodically to monitor their understanding, but a student who struggles with reading may lack these reading strategies or use them inappropriately (National Institute for Literacy 2007). Helping readers become more aware of what they are thinking as they read, or more aware of their “inner conversation,” can lead to greater comprehension (Harvey and Goudvis 2005).

Strategy	Goal and explanation	Common Core Reading Standards for Literacy in Science and Technical Subjects 6–8 (CCSSO and NGA 2010)
Engaging with text	<p>Goal: To develop students’ critical-thinking skills by actively engaging them in the reading process.</p> <ul style="list-style-type: none"> • Summarize—Have students summarize their new learning and important information from the text. • Question the text—Have students document and attempt to answer their questions as they read. • Make connections—Have students connect their new learning from the text to what they observed in a lab, saw in a video or demonstration, or have experienced in their lives. • Make inferences—Have students document what lab results they expect to see or attempt to explain what they have observed in a lab based on what they have read. 	<p>Key Ideas and Details</p> <p>2. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.</p> <p>Integration of Knowledge and Ideas</p> <p>9. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.</p>
Guided grouping	<p>Goal: To develop students’ independence and confidence in reading ability by addressing their specific needs.</p> <p>During student work time, students can choose to work independently, with a partner or small group, or with the teacher. At this time, the teacher can choose to “pull” a small group for instruction based on areas of similar need. The groups are meant to be flexible and are changed based on students’ needs.</p>	<p>Range of Reading and Level of Text Complexity</p> <p>10. By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.</p>

I have students annotate text as a way to slow down their reading, interact with the text, and monitor their understanding. My students do more than underline words or circle important terms; they use annotation to leave a record of their thinking. I start by sharing my own inner conversation with students as I model reading and annotating the text and then let students try it on their own. Students can document when a section does not make sense, note unknown vocabulary, or make connections to their lives or other texts. With practice, students become more proficient at annotating, and I gain insight into their thinking.

Engaging with text

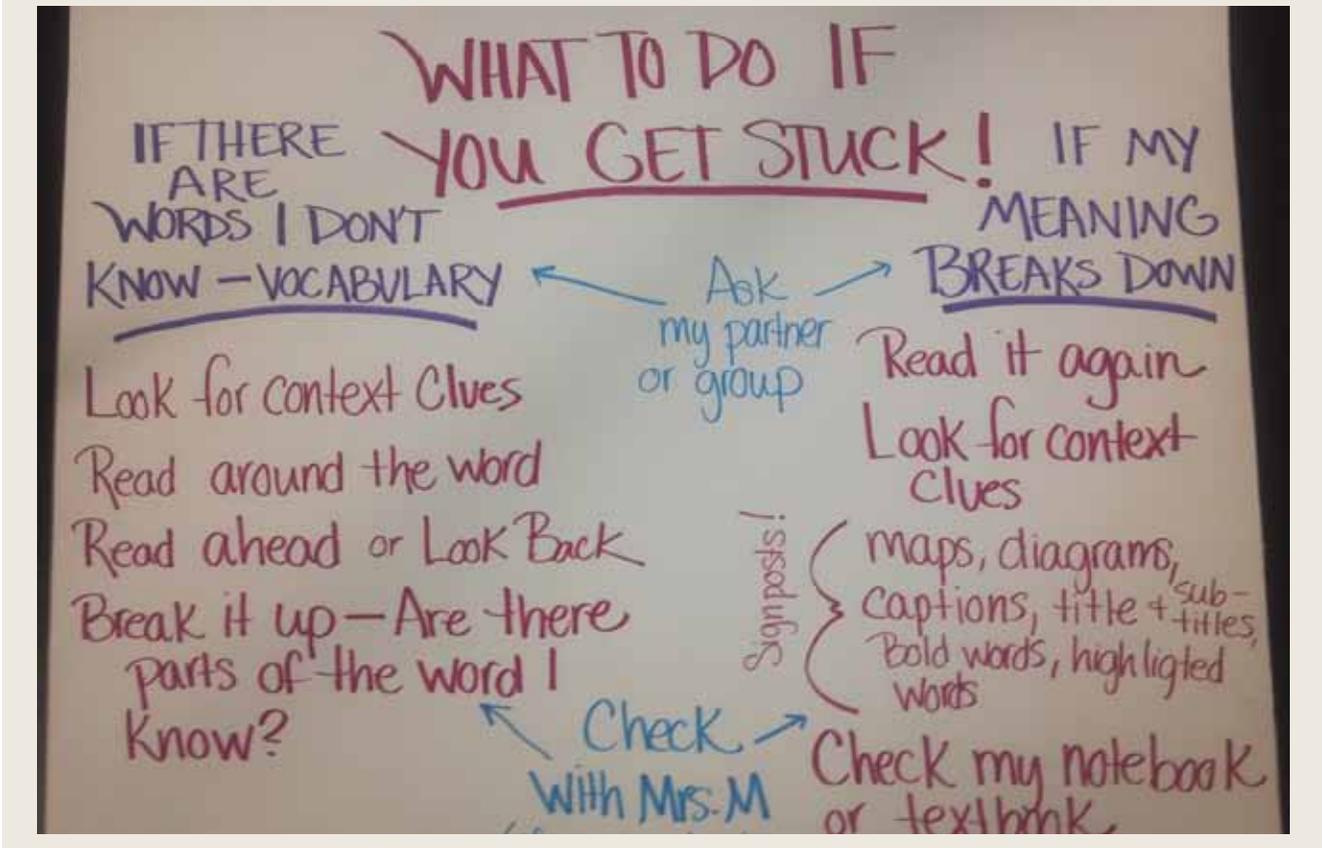
In order for students to learn from text, they must think through and react to it (Harvey and Goudvis 2005). I

begin a unit by having students document what they already know about a concept in their notebooks and then engage them in a hands-on lab experience. My goal is to help students activate and build background knowledge that will be the foundation of their new learning. When students read following a lab they can make connections to our lab experience as well as to what they knew before we began. Students can also refer back to this initial documentation of their thinking and edit any misconceptions or inaccuracies.

Choosing an appropriate strategy to use during a unit can be crucial to the success of your students. Fortunately, there are many strategies that can be used during reading to promote higher-level thinking. I like to have my students document both their new learning as well as their thinking about text as they read. I use lab notebooks with my students, so when it comes time to

FIGURE 2

Strategies poster



read, I either provide them with a copy of the text that they can annotate and paste directly into their notebooks or an organizational tool with headings and subheadings from the text where they can summarize new learning and important information. As students read, they stop periodically to document their thinking using one of the following strategies.

- Summarize—Have students summarize their new learning and important information
- Question the text—Students document questions they have and seek information to answer them as they read.
- Make connections—As students read about new concepts, they document examples from the lab or their lives.
- Make inferences or predictions—This is particu-

larly useful in a lab that takes place over several days. As students wait to see results, they can read and then make inferences about how their new learning relates to a lab. They can also make predictions about what they expect to see in the lab based on the new information.

After students have finished reading, I often ask them to synthesize their learning from the lab, reading, and discussion by writing a lab conclusion. Doing so gives students an opportunity to process and reflect on their new learning. Students must combine several skills to write a conclusion, such as retelling, confirming or adjusting predictions, making inferences, and summarizing important information. This can be a difficult task for students to master, so I provide them with sentence starters, such as “I did this lab to learn...” or “The scientific reason this happened is ...” to help guide their thinking and writing.

Guided grouping

Many people view reading as a quiet, solitary activity, but if you step into my classroom on a day students are reading, you will see many of them reading with partners or groups, stopping often to discuss and document their new understandings. Student thinking about text is extended as they paraphrase information, listen to differing points of view, question each other, and explain their own thinking; this social interaction helps students recall information more easily (Robb 2003). During this time, I allow my students to work in the manner they feel most comfortable: independently, with a partner or small group, or with me. These groupings are flexible, and students know they may join my group at any time and that I reserve the right to choose to have them work with me.

Using these guided groups allows me to provide extra support to students who read at a level lower than the textbook is written or who are struggling with a particular concept. For instance, when a student's understanding is hampered by unknown vocabulary, I can look for strategies to help that particular student become a more successful reader. I can then work with that student individually or in a small, guided group of students with similar needs. During this work time, I have students share their problem-solving strategies with each other. Occasionally we have a whole-class discussion about what students can do when they become "stuck" or do not understand what they have read. As students share their strategies, we create another anchor chart that students can refer to for help as needed (see Figure 2). As students learn new strategies, we add them to the chart.

Conclusion

No matter what subject we teach, we are all reading teachers. Whether students are reading a science textbook or a graph in math, reading skills are necessary for mastering nearly every subject. I have found that the majority of my students care about their learning as long as they feel capable of completing the task they are given. Without support, only the strongest of students are willing to plod through a rough piece of text filled with words they don't understand and information that may not mean very much to them. Providing students with a strategy or graphic organizer they can use while

reading isn't enough. Students need explicit instruction and repeated practice with the strategies they are expected to use before they are truly ready to conquer difficult text on their own. Those who continue to struggle with reading will need the support of individualized or small-group instruction until they have the ability and confidence to work on their own. While my students may not jump for joy when it comes time to grab a textbook from the bookshelf, they are definitely more confident about their ability to decipher the information in nonfiction texts, and they have learned skills that will help them throughout their academic career. ■

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