

CHAPTER TWO

What Makes an Informational Text Complex?

The qualitative dimensions of text complexity can be grouped into the following categories:

- Purpose and main ideas.
- Structure.
- Styles of language and types of vocabulary.
- Knowledge demands.

These categories were designated on the basis of my interpretation of the qualitative measures of text complexity listed in the Common Core State Standards (NGA & CCSSO, 2010), my own analysis of informational texts accessible to students in second- through eighth-grade classrooms, and my experiences working with these students. Beyond the dimensions described in this and the following chapters, there are even more that factor into the complexity of the wide range of texts we classify as “informational.” The endeavor here is to continue deepening our understanding of several features that contribute to an informational text’s complexity.

Purpose and Ideas

Author’s Purpose

The definition of the term *purpose* is “the reason why something is done; the aim or intention of something” (*Merriam-Webster.com*, n.d.). An author has a reason

why he or she is writing a text—a purpose. Traditionally, authors' purposes for writing informational texts have been placed in five categories:

1. To instruct.
2. To recount.
3. To explain.
4. To describe.
5. To persuade.

These categories are considered *genres* of informational texts. Some authors have a clear purpose that fits into one genre or another of informational text. For example, in the text *What Bluebirds Do* (Kirby, 2009) the author's purpose is to describe the behavior of a pair of bluebirds who are mating and parenting. Other authors have multiple purposes for one text, making it a blend or composite of genres. In *Bootleg: Murder, Moonshine, and the Lawless Years of Prohibition* (Blumenthal, 2011), the author's purpose is to recount the events that led up to the passage of the Eighteenth Amendment and then to its repeal. An additional purpose is to explain the numerous factors involved in both the passage and repeal of the amendment.

When trying to unpack complex texts, it is important to consider the author's purpose. A well-written text reveals a clear purpose. Still, if the purpose is not clearly stated, intermediate and middle grade readers need to be cognizant of the idea that an author *has* a purpose, and the reader may need to infer it by asking questions such as “What is the author trying to do here? Recount? Explain? Describe? Persuade?” Understanding an author's purpose moves a reader forward in recognizing structures, grasping specific content, and synthesizing the main ideas in a text. An author's purpose is discussed in more detail in Chapter Three.

Author's Main Ideas

The author's purpose is different from his or her *main idea(s)*. Before a text is even written, the author sets a purpose for writing it. The author's purpose, then, is separate from the messages interpreted by a reader who brings to the text her life experiences, prior knowledge, and so forth. In other words, the author's main ideas emerge as the reader makes sense of the text.

The meaning of the term *main idea* is sometimes elusive because educators and students have interpreted it in many ways. In this book, *main idea* (considered synonymous with “central idea”) is defined as the gist or theme of an informational text. Below I discuss the difference between *gist* and *theme* and provide

examples from *What Bluebirds Do* (Kirby, 2009) and *Bootleg* (Blumenthal, 2011). See Table 2.1 for a summary.

The gist of a text is a very short summary that also conveys a bigger idea or main point in the whole text or in a section of the text. The gist is specific to a particular text. For example, in *What Bluebirds Do* (Kirby, 2009), the gist is that the bluebirds have to work together to ensure the survival of their offspring. The author includes content about how the male and female bluebirds each take actions to make the nest and feed and protect their young; the reader has to infer the idea that this is “working together” and that it ensures the survival of their offspring. Essentially, the reader (with the author’s purpose in mind) has to synthesize the content presented across multiple pages to come up with this gist. Understanding how the author has built this text—how this text works— aids the reader as well. Granted, some authors explicitly state the gist of a text, but when they do not, as frequently happens in texts for intermediate and middle grade readers, the reader must be fully engaged and ready to synthesize and infer.

TABLE 2.1. Purpose, Gist, and Theme

Term	Definition of term	<i>What Bluebirds Do</i> (Kirby, 2009)	<i>Bootleg</i> (Blumenthal, 2011)
Purpose	The purpose is the reason why a text is written: to provide instructions, to recount, to describe to explain, to persuade.	The author’s purpose for this text is to describe the behavior of a pair of bluebirds that is mating and parenting.	The author’s purpose is to recount the events that led to the passage of the Eighteenth Amendment and then to the repeal of this amendment. An additional purpose is to explain the numerous factors involved in the passage and repeal of this amendment.
Gist	The gist of a text is a very short summary that also conveys a bigger idea or main point in the text.	One gist in this text is that the male and female bluebird mates have to work together to ensure the survival of their offspring.	One gist is that during this period, groups of activists became aware of the power of the vote and used this power as a tool for getting the Eighteenth Amendment passed in Congress.
Theme	The theme of a text is a global idea that can be applied to the text in hand.	Some species mate and work jointly to ensure the survival of their offspring.	People’s beliefs drive their actions. Perseverance is required to initiate, pass, and repeal legislation. Some solutions can have unexpected effects.

In *Bootleg* (Blumenthal, 2011), one gist might be the following:

During this period, groups of activists became aware of the power of “the vote” and used this power as a tool for getting the Eighteenth Amendment passed in Congress.

There can be more than one gist conveyed in a text. Another gist in *Bootleg* might be the following:

The Eighteenth Amendment, which set limits on an individual’s consumption of alcohol, did not necessarily have the ideal outcomes expected by its proponents. Prohibition, which led to lawlessness, corruption, murder, and social protests, could be considered a failed social experiment.

Again, identifying this gist requires active engagement by the reader, who becomes a virtual partner in conversation with the author about the text’s content and the ideas being conveyed.

The theme of a text is a global idea that can be applied to both the text in hand as well as other texts. Identifying the theme is harder than identifying the gist because the reader has to think beyond the text and ask questions such as “What is the author’s message in this text that I might use as a lens for understanding other topics or issues?” Yes, the author may have a “theme” in mind while writing a text, but the reader plays a huge role in identifying this theme, using his or her real-life experiences, prior knowledge, and related vocabulary (e.g., *hope*, *perseverance*, and *diversity*—words not used in the text itself). A reader of *What Bluebirds Do* might derive the following idea as a theme: Some species mate and work jointly to ensure the survival of their offspring.

Again, there might be many themes in a text. The themes that emerge will depend on the reader’s synthesis of the content. In *Bootleg*, the following themes might emerge:

- People’s beliefs drive their actions (whether for or against some issue).
- Perseverance is required to get legislation approved or changed.
- Some solutions can have unexpected effects.

What’s important to consider here is that the main ideas I have discussed (as gist or theme) are *textual*; that is, there is textual evidence to support the ideas. Most likely, the author had these ideas in mind as he or she wrote the text. With texts geared toward intermediate and middle grade students, though, there is a higher demand on readers to synthesize and infer these ideas as they read. In Chapter Eight, I explain further how main ideas are constructed.

Idea Density and Difficulty

The passage from *Bones: Our Skeletal System* (Simon, 2000) that I analyzed in the Introduction might be considered *dense* with ideas. In other words, there are a lot of ideas or details to absorb in a compact or short section of text. But the author's structuring of the text—describing the spine and then zooming from the larger backbone to the organization of the smaller vertebrae as a way to build toward a description of the spine's function—is effective. He is careful to limit the number of domain-specific terms, and he uses comparisons at critical points to promote deepening understanding. In addition, there is a full-page photograph of a section of the spine with three distinct vertebrae fastened together in a column. So although this passage is dense with ideas, Simon's intended audience (provided they understand how informational texts work) could make sense of what he is trying to convey. Therefore, the text is not too arduous or difficult for many well-matched readers to manage.

In some texts, though, the density of ideas can make the reading difficult, even onerous. Perhaps the author's purpose is too ambitious, and he or she wants to report too much content. It could also be possible that the author assumes, inappropriately for his or her audience, too much prior knowledge on the part of the readers. Consider this passage, which is the first paragraph in the book *England: The Land* (Banting, 2012; the words *bogs* and *moors* are bold in the original text):

From above, England looks like a patchwork quilt made of many squares. Each square is a farmer's field, where crops such as wheat and beets grow. Between the farms are lush valleys, rolling green hills, **bogs, moors**, and mountains. Along with Scotland to the north and Wales to the southwest, this green land occupies the island of Great Britain. Great Britain is part of a country called the United Kingdom, which includes Northern Ireland. Northern Ireland shares an island with Republic of Ireland, to the west. (p. 4)

For the intended audience, perhaps fourth grade students and older, there is an overwhelming amount of content in this paragraph. Banting's purpose seems to be to describe the landscape and location of England. Like Simon's structure in *Bones*, but in reverse, Banting attempts to move from a close-up view of England's terrains to a wider view of its location in regard to other regions and countries. She begins with a comparison of England's landscape to a patchwork quilt and then notes the types of crops that can be grown there. Unlike Simon's solid analogy of each vertebra in the spine being "hard and hollow, like a bead or spool of thread" and the vertebrae forming "a flexible chain of bones that can twist like a string of beads" (n.p.), Banting's (2012) analogy of a patchwork quilt quickly falls apart. If each of a farmer's crop fields represents a patch on a quilt, then what do

the spaces “between the farms”—“lush valleys, rolling green hills, bogs, moors, and mountains” (p. 4)—represent? The author doesn’t tell us.

The passage also contains an abundant amount of vocabulary that is likely to be unfamiliar to many intermediate grade readers. What does it mean for a valley to be *lush*? What does it mean for a hill to *roll*? What are *bogs* and *moors*? It is not that these readers shouldn’t read texts with these terms and learn them, but the density of terms and the lack of support in figuring them out do not make grappling with the meaning of these terms feasible.

The text becomes even more difficult in this sentence from the same passage.

Along with Scotland to the north and Wales to the southwest, this green land occupies the island of Great Britain.

First, the text does not include a map to use as a reference. So the reader has to tap her understanding of maps and directionality and create a mental image of Scotland “to the north” and Wales “to the southwest.” To the north and southwest of what, though? We do not know yet because the author does not state the subject of the sentence—“this green land” (p. 4)—until after this initial phrase. Even then the reader has to realize that the words “this green land” refer to England. “Green” is only noted as a descriptor of “hills” in the second sentence. So the reader has to infer that the author is considering all of the farmers’ fields, the valleys, the hills, the bogs, and the moors to be “green” and, therefore, that “this green land” must be referring to England. Finally, returning to the mental map, the reader has to visualize Scotland, Wales, and England “occupying” the island of Great Britain.

Take a moment to reread the initial excerpt from this book again. The last two sentences could be considered misleading or just confusing. (I had to engage in a search of terms on the Internet to make sense of it all myself.) Somehow the reader has to figure out that England, “along with” Scotland and Wales, are parts of a larger region called Great Britain (which is also an island), although this is never stated directly. Great Britain and Northern Ireland are two regions that, combined, make up the country, or sovereign state, called the “United Kingdom.” (Technically, the name of this country is the United Kingdom of Great Britain and Northern Ireland.) The rest of Ireland (separate from Northern Ireland, but still the same island) is its own sovereign state, called the “Republic of Ireland.”

By now the difficulty of this text should be clear, so I will just add that there are no maps featured on this page or the next facing page. There are four photographs on these two pages, but they are of little help in understanding the text. The second and only other paragraph on the page is equally dense and difficult.

Yes, this is only the first page of a book about England, but even as an introduction it is unreasonably dense and conceptually difficult, with some problematic gaps in the content. Reading and understanding this text was arduous, even

for me. Sometimes a text's complexity is appropriate and provides an opportunity for a reader to engage in rigorous thinking and learning. At other times, a text is simply difficult and, as a result, unmanageable for certain readers. Frequently this occurs when the ideas are too dense because the author is covering too much content and assuming too much knowledge on the reader's part. It might also just be that the text is badly written.

Structure

According to *Merriam-Webster.com* (n.d.), the definition of the term *structure* is "the way that something is built, arranged, or organized." This definition implies that the parts serve to support each other or are interrelated. An author's purpose governs how he or she structures a text. In other words, the author constructs a text, arranging and organizing its parts, with the purpose of the text in mind. This carefully built, purpose-driven structure contributes to the cohesion of a text, the unity of ideas. The more cohesive a text, the more likely the reader will be able to follow the flow or logic of the author's ideas.

Traditional Structures at the Macro and Micro Levels

There are five structures commonly referred to in the professional literature:

1. Enumerative.
2. Sequence/chronology/narrative.
3. Comparison.
4. Causal relationships.
5. Problem–solution.

(See Table 2.2 for a brief explanation of these structures; they are explained in more detail in Chapter Four.)

Some authors use these structures at the *macro level*; this means that the whole text (or a large section of the text) is organized into one of these structures. In my experience, enumerative, sequence/chronology/narrative, and problem–solution structures are more often employed as whole-text structures at the macro level than is comparison or causal relationships structures. But authors also employ these structures at the *micro level*—in a sentence or just a few sentences. When an author does this, it can be considered a *type of detail* rather than a text's structure. For example, at multiple points in *Trapped*, Aronson (2011) departs from the narrative of the miner's experience to describe the equipment being used to rescue

TABLE 2.2. Brief Description of Text Structures

Type of structure	Brief description
Enumerative	The text has an overarching topic and clear subtopics that provide more information about the main topic.
Sequence/chronology/narrative	The text is written as a series of steps in a process or of events in time order.
Comparison	The content of the text examines the differences and similarities between two or more objects or ideas.
Causal relationships	The cause(s) and effect(s) of a particular situation or context are explained.
Problem–solution	A problem is identified, and a solution or possible solution is explained.

Note. See Chapter Four for an in-depth discussion regarding each of these structures.

the miners. In the following two sentences, Aronson’s comparison of different drills to a percussion hammer water-well drill functions at the micro or detail level:

Other drills cut by turning, screwing down into the ground. This percussion hammer pounds as it turns. (p. 78)

In this example, Aronson uses a comparison as a type of detail to build and convey an idea. This distinction between text structures employed by authors at the macro and micro levels is discussed further in Chapter Four.

Figurative Language and Other Types of Details

As just mentioned, authors use several types of details to build meaning in a text. These details, which exist at the micro or detail level, might occur in a few sentences, in a single sentence, or even in just a phrase. Remember my analysis in the Introduction of the excerpt from Simon’s (2000) *Bones: Our Skeletal System*? To describe the backbone, he uses details about the backbone’s location, its parts, and its physical attributes. He also uses similes, comparing the “hard and hollow” attributes of a vertebra to “a bead or spool of thread” (n p.). Details contribute to the structure of a text, and being able to recognize categories or types of details can help a reader begin to grasp the content. Imagine if a reader said, “Oh, Simon just named the *location* of the spine! It runs down the middle of the body!”

Similes and other types of figurative language are rampant in informational texts. Brian Floca's Caldecott Award-winning book *Locomotive* (Floca, 2013) is peppered with *onomatopoeia* describing the sounds of the train: "huffs," "bangs," "chug-chug," and "whoooooo whoooo whoo." He employs *personification* as well, clearly casting the locomotive as female: "She's waiting in the railyard, ready for her work" (n.p.). Like Simon, Floca utilizes *similes* in sentences, such as, "Up in the cab—small as a closet, hot as a kitchen—it smells of smoke, hot metal, and oil" (n.p.). He also plays with *alliteration* in his descriptions, such as the work of the steam moving the train forward: "It *pushes pushes pushes* the pistons, which *push* and *pull* the rods" (n.p.). Figurative language is part of how a text works; it plays a role in the overall structure of a text. Different types of details commonly found in non-narrative and narrative informational texts are described further in Chapters Five and Six.

Multimodality

There are multiple modes, used for a variety of purposes, in informational texts. The visual mode includes the *running text* and the *text features* and how these two aspects are designed and laid out. Online texts offer additional modes in which information can be experienced, for example, with video and audio clips. Many of these texts can be interacted with and marked up by the reader as well, thereby providing yet another way to experience the text. Multimodality contributes to the complexity of a text.

To illustrate the complexity of a multimodal text, let's consider the initial two-page spread of an online *Junior Scholastic* article titled "The Real Cost of Fashion" (Anastasia, 2013). (I recommend viewing this article—in particular the first two pages—to aid in understanding my explanation below, at junior.scholastic.com/issues/09_02_13/book#/6.) One of the author's purposes in this article is to describe the complex relationships between clothing manufacturers in the United States and the contractors to whom they outsource work in less industrialized nations. On the far left-hand side of the first two-page spread, the author includes a series of three different-sized photographs that convey the effects of having access to cheap clothing. The first image is of a smiling teen in a dress and heels, accessorized with sunglasses and carrying several shopping bags in both hands. Next there is a graphic arrow that draws the reader's eye up the page from the shopper to a photograph of an unsmiling Chinese female worker, sitting at a sewing machine in a long row of other employees also sitting at machines. Overlapping, just to the right, is a third photograph of the factory that collapsed in Bangladesh in the spring of 2013. A clear message is conveyed in this series of three images.

The last photograph has a graphic of a small circle with the words “watch the video.” The reader can click on this circle and watch a news video describing the working conditions of these factories, the tragedy of the factory collapse, and shifts in government policy to provide more rights for workers. Here the reader experiences a message via visual and auditory modes of text.

In the bottom right-hand corner of the second page, separate from the photographs and the video icon, there is a chart with a photograph of a denim shirt in the center. On one side of the shirt are statistics outlining the cost of manufacturing this shirt in the United States and, on the other side, the (much cheaper) cost of manufacturing the same shirt in Bangladesh. This chart provides still another way to experience the author’s message.

Then there is the running text with statistics and details that reveal the pros and cons for multiple issues in this context. Yes, the working conditions in these countries can be unsafe, but these are the only jobs for many poor people in those countries. Yes, the disaster was terrible and working conditions should be improved, but the cost of making and sustaining the improvements may encourage manufacturers to leave the country in search of cheaper labor. Yes, clothing manufacturers can make their products in the United States, where conditions are guaranteed to be safer, but the cost of clothing for the American consumer would go up drastically. And so forth.

Together, the series of photographs, the video, the chart, and the running text make the entire informational text *complex*. Each contributes to the meaning, but they are also carefully interwoven to create the larger meaning in the text. The result is not only multiple ways for the reader to experience the content, but also multiple layers of information that serve to reinforce, again and again, the author’s main ideas.

Text Features

As noted in the discussion of multimodality, the *features* of a text also contribute to its complexity. Text features are distinguishable elements of a text. More important, they serve to interconnect the multitude of other parts in a text, helping readers access the main ideas. Think about the first three images in the *Junior Scholastic* article, “The Real Cost of Fashion” (Anastasia, 2013), I just described. This series of photos helps readers visually access the main ideas in the article. Other text features that provide similar support, or even extend the ideas in the text, include:

- Photographs and illustrations.
- Captions and labels.

- Diagrams.
- Charts and graphs.
- Tables.
- Boxes and sidebars.
- Maps.
- Glossaries and pronunciation guides.

Still other text features help the reader locate information and even predict what content will be included in the text, such as:

- Titles.
- Contents.
- Headings and subheadings.
- Index.

In the past decade, text features have become an integral part of informational texts, supporting the author's purpose, the running text, and the development of the main ideas.

Layout and Design

When I was in elementary and middle school in the mid-1970s to early 1980s, I rarely read informational texts except to write the required annual research report. This may have been because these informational texts came in just two colors: black and white. When you looked at a text, you could expect to see a lot of extended prose and a few text features interspersed here and there—a heading or subheading in a plain font, a photograph (black and white), perhaps a map or diagram or chart. The presentation was flat and dull. As you have probably noticed, texts have changed tremendously. Now they are full of eye-appealing features, sometimes too many! When we try to make sense of so many features, it is important to consider the role that layout and design plays in the structure of the text.

The layout of a text is the way in which the various parts, such as text features, extended text, key words in bold print, and so forth, are positioned on the page. The design is the purpose and planning behind the layout. Layouts are intended to be attractive and catch the reader's eye. More noteworthy, though, the layout of a page is carefully planned to serve the author's purpose and to provide a way for aspects of the text and the ideas they convey to be presented cohesively. On the two-page spread of the *Junior Scholastic* article (Anastasia, 2013) discussed previously, the intentional layout and design reveal the author's purpose

and ideas. The text features I described are laid out in a way that makes accessing the purpose and predicting the main ideas feasible. For example, just as English prose is written from left to right, there is a clear left-to-right orientation in the series of three photographs, beginning at the bottom left-hand side of the first page and moving up and to the right. The chart comparing the costs of making a shirt is tucked neatly into the bottom right-hand corner of the second page. Positioning the chart this way does not interfere with the orientation and meaning of the series of photographs. After the reader has digested the first set of images, she can turn her attention to this chart without being disturbed by other graphics or images as a result of the chart's placement.

Language and Vocabulary

Register and Tone

Register, or style, is a particular type of language used for a particular purpose. The tone of the text is the way the author expresses his or her attitude throughout the text. In what we might consider traditional informational texts, the register is frequently formal and the tone is distant, unemotional, and objective. Mostly, the author is presented as the expert, imparting information to the reader. For example, the passage from *England: The Land* (Banting, 2012) discussed earlier is written in a formal register and objective tone. This style of text tends to distance the author and the reader from each other and discusses subjects in the grammatical third person as *he*, *she*, and *they*.

Many authors of informational texts still use the grammatical third person, but have adopted a less formal tone. A good example is *How They Croaked: The Awful Ends of the Awfully Famous* (Bragg, 2012). This passage is from a chapter titled “Elizabeth I: She Kept Her Head about Her”:

The red-haired Elizabeth was twenty-five years old when the coronation ring was placed on her long, narrow finger. Now that she was queen, her advisers set her up on dates and told her to get a husband, have an heir, and then she'd be safe. She liked men and they liked her—but she liked her head more. (p. 44)

The author employs a humorous tone and a less formal style, using colloquial language such as “told her to get a husband” and “she liked men and they liked her.” His register and tone serve his purpose: to describe the gruesome deaths of famous historical figures in an entertaining way, for an audience of intermediate to middle grade students.

Heart and Soul: The Story of America and African Americans (Nelson, 2011) is a narrative told from the perspective of a fictionalized, elder African American

woman. Nelson uses a grammatical first person, with the narrator fully present as “I,” engaged in a conversation with the reader as “we.” The woman speaks directly to the reader in an informal register with an intimate tone:

Many of us are getting up in age and feel it’s time to make some things known before they are gone for good. So it’s important that you pay attention, honey, because I’m only going to tell you this story but once. (p. 7)

The narrator continues the conversation throughout the book, asking the reader questions such as “Oh, did I mention that their ‘property’ included us?” (p. 13). This question positions the reader as an active meaning maker who has been processing what was said prior to this point in the text. Nelson’s choices of register and tone support his purpose. The result is that the reader experiences a narrative of African American history—ordinary people facing and overcoming terrible obstacles—alongside a wise elder who has experienced racial discrimination herself.

In *Things That Float and Things That Don’t* (Adler, 2013), the author’s purpose is to explain the properties of density—size, weight, and shape—by observing whether everyday objects sink or float. Adler speaks directly to the reader: “Why do ice and icebergs float? You can find the answer in your freezer” (n.p.). He implies that a conversation is happening between himself and the reader. He asks you, the reader, a question. Then he responds, as though in a conversation, with his own answer. Adler uses the grammatical second person (“you”), and although his style is less formal, he still positions himself as the expert or person-in-the-know.

General Academic Vocabulary

Academic vocabulary is vocabulary associated with schooling occurring relatively frequently in different classroom contexts. For example, students might hear the term *evaluation* used during the analysis of literary texts, during the discussion of a method used during a science lab, and when considering the value of including a primary source as part of a history presentation. In the case of informational texts, academic vocabulary may include terms used in the texts themselves, in a discussion of texts, and in thinking through the writing used in these kinds of texts. Students must understand an abundance of these words to work effectively with informational texts—that is, to comprehend the content and ideas and to communicate their learning. Consider the academic vocabulary already discussed in this chapter related to the types of details (*location, physical attribute, simile*), text features (*graphics, diagrams, photographs*), and text structures (*enumerative, problem–solution, causal relationships*).

In addition, there are connective words such as *however*, *moreover*, and *nonetheless* that reveal the relationships between ideas. Connectives create cohesion between ideas. These words are generally categorized in four groups: additive, temporal, causal, and adversative. I discuss connectives further in Chapter Seven.

Domain-Specific Vocabulary

Informational text authors rely heavily on domain-specific vocabulary to formulate and develop ideas. These are content-area words that students may not see very often when they are reading broadly but will see several times during a unit of study on a particular topic or issue. Notice the domain-specific words in this excerpt from the book *Honeybees* (Heiligman, 2002):

Worker bees called nurse bees feed the larva royal jelly, which comes out of glands in a worker bee's head. Royal jelly is packed with vitamins and proteins. When the larva is three days old, the workers begin feeding her beebread, a mixture of honey and pollen from flowers. (p. 11)

This short paragraph is packed with domain-specific vocabulary. In the first sentence alone, Heiligman names a general type of bee—the *worker bee*—and then a more specific type of bee—the *nurse bee*. She names the food, *royal jelly*, that is fed to the *larva*, and describes where this food comes from—*glands* in the worker bee's head.

Domain-specific vocabulary is frequently considered hard for students to grasp and master. The beauty of informational texts is that these terms are frequently consistent across texts on the same topics or issues. Multiple exposures to these words while reading texts in classroom discussions and during other learning experiences will deepen students' understanding of these words.

Knowledge Demands

Authors are aware of their audience and have certain expectations about their readers' familiarity with their topics and ideas. Knowledge demands refers to expectations about readers' life experiences (background knowledge), prior knowledge, and content or disciplinary knowledge.

Background Knowledge

Students' background knowledge is the knowledge they have developed as part of life experiences outside of the school classroom. As we know, these experiences

vary widely, and tapping these experiences may or may not be useful in understanding informational texts. Many authors try to help their readers use background knowledge to grapple with conceptually difficult ideas. For example, in *A Black Hole Is NOT a Hole*, DeCristofano (2012) uses snowballs as a way to think about the force of gravity:

When there's a lot of matter, there's a strong pull. Less matter means a weaker pull. For example, imagine a fluffy snowball and a harder-packed snowball of the same size. The fluffier ball is made of less stuff. Its pull is wimpier than the pull of the densely packed ball.

You can feel this difference when you hold the two snowballs in your hand. Each one presses down on your hand because of the gravitational attraction it shares with Earth. The hard-packed snowball has a stronger attraction to Earth because it is made of more material. (p. 14)¹

The problem here is that background knowledge, or personal life experiences, are not universal. If you have lived in a place where there is enough snow to make snowballs, you can tap personal experiences to understand the text better. If you have never seen or experienced snow, this connection may not help you much.

Prior Knowledge

Prior knowledge is information or skills acquired during school experiences—formal academic or domain-specific knowledge. Sometimes authors assume a reader has particular prior knowledge. In the text *Alien Deep: Revealing the Mysterious Living World at the Bottom of the Ocean* (Hague, 2012), the author's purposes are to describe the hydrothermal vents located the bottom of the ocean and to narrate the story of a team of scientists who explored the vents. Early in the book, there is a section wherein the author describes the initial discovery of hydrothermal vents deep in the ocean. In order to understand the physical attributes of hydrothermal vents, the reader also needs to understand the role of the Earth's plate tectonics in creating those vents. In this case, Hague does not take this knowledge for granted and clearly defines and describes *plates* and *plate tectonics* in the following excerpt:

Today, we know that Earth's crust is broken into great slabs called plates that travel across the planet's surface as though on some sort of slow-moving conveyor belt. The complex interaction of these plates is called plate tectonics, and it is the force

¹From *A Black Hole Is NOT a Hole*. Text copyright © 2012 by Carolyn Cinami DeCristofano. Used by permission of Charlesbridge Publishing, Inc. All rights reserved.

behind mountain building, volcanic and earthquake activity, and the slow reshaping of Earth's continents. (p. 13)

In the next paragraph, however, Hague doesn't define or explain the mantle and core parts of the Earth's layers. He assumes his readers have some prior knowledge of these concepts when he writes the following:

At places where two plates were pulling apart, known as spreading centers, geologists thought that heat from the mantle would break through as a sort of exhaust system for Earth's core. (p. 13)

Even in the first excerpt, when Hague states, "Today, we know that the Earth's crust is broken into great slabs," he is assuming the reader knows that the *crust* is the Earth's outermost layer.

Disciplinary Viewpoint

Another common assumption of informational text authors is that readers understand the ways of thinking and creating knowledge that are inherent to the author's field. For example, scientists and engineers engage in inquiry through *investigating, evaluating, and developing explanations and solutions*. This inquiry is an iterative process that also includes asking questions, observing, experimenting, measuring, arguing, critiquing, analyzing, imagining, reasoning, calculating and predicting. Knowledge is not treated as a static entity; instead it accumulates, changes, shifts, emerges, and evolves. This way of thinking and creating knowledge is inherent in texts about science and engineering; frequently, the authors are actually scientists or engineers themselves. An example of this kind of thinking, this kind of creating knowledge, is apparent in the book just described, *Alien Deep* (Hague, 2012). The author contrasts what was understood in the field of geology in the 1970s with what we know now. He implies that arriving at our current understanding of hydrothermal vents required not only discovery, but also "finding" that discovery—that is, asking questions, inventing methods to explore, observing, and so forth (p. 13).

Authors of historical texts consult primary and secondary sources related to their topics. Their conclusions are based on their interpretation of these sources. In a sense, these authors make claims or educated guesses about their topics based on the evidence they gather from their sources. The authors' choices of language in a text reveal their interpretation. For example, in *The Dust Bowl Through the Lens* (Sandler, 2009), notice the language the author uses in the first sentence of the section called "Destroying the Land":

Certain that wheat prices would continue to rise and confident that the beneficial rains so vital to the crops would continue to bless the region, southern plains farmers plowed up miles of the virgin prairie soil. (p. 10)

Words such as “certain” and “confident” have an evaluative connotation. Sandler has made a judgment about the mindset of the farmers, based on his research and interpretation of sources. It’s not that most of us are not in agreement with the author. As readers, we just need to realize that his account of what happened and the motivation and mindset of the agents involved are the author’s interpretation.

An abbreviated description of each of the qualitative dimensions I described in this chapter can be found in the last part of the book, “Closing Thoughts,” Table 1, pp. 126–129. In the next six chapters, I examine in more detail five of the qualitative dimensions of text complexity introduced in this chapter:

1. Author’s purpose.
2. Text structure.
3. Types of details (in non-narrative and narrative texts).
4. Connectives.
5. Main idea construction.

Although these chapters discuss in isolation particular qualitative dimensions of informational text, we need to remember that these *parts* are connected and contribute to the *whole*.