

## Comprehension/Knowledge Building, Grade 4-6

### Comprehension

#### What is comprehension?

In terms of reading, comprehension is the "intentional thinking during which meaning is constructed through interaction between text and the reader." Readers are involved in intentional problem solving as they are reading in order to make sense of text (National Reading Panel, 2000). "Getting meaning" is a two-level process. On the first level, readers employ foundational reading skills to identify individual words and their meanings, as determined by the immediate context, to arrive at a literal understanding of what the author has written. On the second level, readers interpret the entire grouping of words they read; they consider the relationships of these words to each other and to any relevant knowledge they may already possess.

Analytic, evaluative, and reflective comprehension occurs during this second level of meaning construction. This is not to say, however, that the foundational skills needed to achieve literal comprehension are of less weight than those necessary for the higher-order comprehension processes.

Students' productive, literal comprehension depends in large part on their skill in decoding, or word recognition, and on the breadth and depth of their vocabulary knowledge.

#### The relationship between decoding and comprehension

Research has established that people who comprehend text effectively are skillful at decoding words on the basis of grapho-phonemic, or sound/spelling, cues. To read a word, these readers sound it out, blending the individual sounds represented by the word's letters or spellings. Once they have blended them, they can recognize what the word means, because most of the words in the materials they read are words that have been in their listening and speaking vocabulary (Gough & Tunmer, 1986). In fact, researchers who have studied decoding emphatically point out that poor word-level decoding is a critical bottleneck in the comprehension process. When a reader cannot recognize or decode a word, it is impossible for him or her to understand what the word means (Adams, 1990; Pressley, 1998). Decoding is the critical first step in comprehending text.

A lack of skill in decoding words directly affects students' comprehension. This is because word recognition and comprehension compete for attention. The more effort readers require to decode a word, the less attention they have left for comprehension. If readers have to struggle with individual words, they easily lose track of meaning. Further, it is the words in a text that constitute the basic data required by higher-order comprehension processes.

Fluency is critical. Fluent readers are able to devote minimal attention to word recognition and maximum attention to comprehension. Most teachers have worked with young students who can sound out words—with some effort—but who do not seem to understand or remember any of what they read. All of their attention is consumed by word recognition to the exclusion of comprehension (Gough & Tunmer, 1986).

The best scientific evidence that fluency improves comprehension comes from a study of seven- to ten-year-old students who were termed "weak" readers (Tan & Nicholson, 1997). In this study, students in one group, Group A, received instruction that emphasized word recognition, with only brief attention given to the meanings of the words. Students in this group practiced recognizing target words until they could read each word without hesitation.

In contrast, students in a second group, Group B, received instruction that was heavily oriented toward developing their understanding of the meanings of the target words. No attention was given to the development of word recognition. The experimenter read—but did not show—target words to the students in this group, then discussed with them the meanings of the words. Following this instruction, students in both groups read a passage that contained the target words. After reading, each student completed a set of comprehension questions, some of which could be answered based on literal information in the passage and some of which required students to make an inference based on combining pieces of information. The most important finding of the study was that the students in Group A, who received word recognition and fluency instruction, answered more comprehension questions correctly than did students in Group B, who did not receive such instruction. Other students have confirmed that more rapid decoding improves comprehension, probably by freeing up more attention (Breznitz, 1997a, 1997b).

For good readers, instantaneously recognizing the letters or spellings of a word activates knowledge of spelling patterns, pronunciations, and meanings. At the same time, these readers use knowledge of context to establish the coherence of the message in the passage being read. In this way, they come to recognize the spelling, sound, meaning, and contextual role of a familiar word almost automatically and simultaneously, freeing their attention for critical and reflective thought. Thus, good readers appear to recognize words as wholes because they have developed a thorough and interconnected knowledge of the spellings, sounds, and meanings of the words. However, to the extent that readers skip or guess at the meaning of unfamiliar words, they limit opportunities for such knowledge to develop (Adams, 1994).

So, even though the scientific evidence favors grapho-phonemic cues as primary to fluent decoding, semantic or meaning cues play an important role in reading. Successful readers recognize when they have misread a word because the word does not make sense to them in the context of what they are reading; that is, good readers monitor their comprehension as they read (Gough, 1983, 1984). They can do so because their fluent recognition of words now requires little attention, and hence frees up more attention for higher-order comprehension processing, including monitoring whether the text being read makes sense.

The fundamentals of decoding are covered in depth in the following first grade courses: Phonemic Awareness and Phonics, and Phonics and Fluency. Decoding is also covered in the Phonics and Fluency course for grades 2-3.

### **Vocabulary knowledge and comprehension**

The powerful relationship between reading comprehension and breadth and depth of vocabulary knowledge is one of the most consistent findings in educational research. Time and again researchers have found that (1) readers who comprehend well generally have extensive vocabularies (see Anderson & Freebody, 1981; Nagy, Anderson, & Herman, 1987), and that (2) improving students' vocabularies improves their reading comprehension skills (see Beck, Perfetti, & McKeown, 1982; McKeown, Beck, Omanson, & Perfetti, 1983; McKeown, Beck, Omanson, & Pople, 1985).

The relationship works as follows. Students who are poor readers often do not have the vocabulary knowledge that is necessary to get meaning from what they read. Because reading is difficult for them, they cannot and do not read widely; thus, they do not encounter unknown words in print often enough to learn them. This results in what Stanovich (1986) calls "the Matthew Effects": good readers read more, become better readers, and learn more words; poor readers read less, learn fewer words, and generally become poorer readers.

Effective vocabulary instruction must do more than teach dictionary definitions for words; it must encourage students to use, reuse, and study the new words they encounter as they read and write. In *Open Court Reading* and *SRA Imagine It!*, three skills for vocabulary development are taught: context, word structure, and apposition. Most vocabulary words that students acquire are not taught explicitly, but rather are learned incidentally from context as part of wide reading (Sternberg, 1987). Therefore, the most important mechanism students have for acquiring vocabulary is to read challenging, complex texts that are filled with new words—the words that successful readers learn and know (Stanovich, 1986).

### **Higher-order comprehension**

Higher-order comprehension involves cognitive processing above the word-level processing that is necessary if readers are to move beyond literal comprehension to deeper understandings of how words work together to create meaning. Over the years, researchers have examined a variety of these processes, including those that occur automatically and out of readers' conscious control, and those that readers control consciously.

### **The unconscious processes in comprehension**

Successful readers know a great deal about the world and what happens in it. Their vast body of knowledge affects their understanding of text. Activating this knowledge base, however, is often an automatic process that is out of readers' conscious control.

In the 1970s and 1980s, cognitive and educational psychologists began to apply to reading comprehension a theory of learning based on how knowledge is unconsciously structured and activated. This view of learning is known as *schema theory* (Anderson & Pearson, 1984; Anderson, Reynolds, Schallert, & Goetz, 1977). The focus of schema theory relevant to comprehension is how readers activate various schemata as they read to bring about the construction of meaning.

According to schema theory, knowledge (schema) is a huge network of abstract mental structures that represent our

understanding of the world. A general category of schema includes slots for all the features included in the category. Each of us has many schemata. Relationships among our schemata are like webs, with each schema interconnected to many others.

The importance of schemata is that they help us understand events easily and automatically. Therefore, once some small part of a schema is encountered while reading or listening, this activated schema permits us to make reasonable inferences about the details of the event. So, for example, if we encounter an idea such as giving a dog a bath, then the first trigger—perhaps a dog and a tub—triggers other information, such as water, soap, a hose, a dog struggling to get out of the tub (if that has been our experience), and so forth. Our schemata grow and change as new information is acquired through experience and reading.

Researchers who applied schema theory to reading comprehension found that for a good reader, a schema is activated as the reader begins to read a text, and this initial schema activation affects all subsequent inferences the reader makes about the text. For example, as soon as adult readers begin to read a real estate ad, they activate a great deal of knowledge about houses, experiences with realty companies, and so on. This activated schema affects their comprehension of the ad by focusing their attention on specific information that would be of less importance if some other schema had been activated. Someone interested in buying a house and someone who is thinking about breaking into a house will each "understand" the real estate ad very differently (Pichert & Anderson, 1977).

Schemata related to the structure of text itself are especially important to comprehension. Text genres such as narratives, informational text, fairy tales, fables, and plays have conventional structures that are familiar to adult readers (Kintsch & Greene, 1978). For example, it is known from our many reading experiences that a narrative, or story, generally includes a setting, characters, a plot or story line that involves the establishment of a problem, the initiation of events to solve the problem, frustration of a character in solving the problem, the character's eventual success, and a conclusion (Mandler, 1978; Mandler, 1987; Stein & Glenn, 1979; Stein & Nezworski, 1978). For students, knowledge of text structures increases their comprehension and memory of the texts they read. This relationship is causal—having knowledge of a text's structure improves understanding of the text (Armbruster, Anderson, & Ostertag, 1987; Short & Ryan, 1984). Readers can activate a schema by encountering information in a text that relates to the schema category. Once activated, this schema triggers connections to other schemata, and thus affects comprehension of what is being read. To develop this process, it is important to build students' networks of schemata by building their store of general knowledge and concepts. Many learning difficulties can be traced to a lack of general knowledge. General knowledge can be enhanced through not just reading but reading-related discussion and through teachers modeling an explanation of how an existing piece of knowledge connects to a new idea or concept that is encountered in reading.

Comprehension is much more complex than remembering what was read. It requires comparing and contrasting new information with existing knowledge, drawing conclusions from this comparison, and reaching new understandings not only of the material at hand but also of the world in general.

### **The conscious processes in comprehension**

Researchers have determined that good adult readers actively coordinate a number of conscious processes before, during, and after reading (Pressley & Afflerback, 1995). Good readers know how their reading is going and why; they monitor themselves while reading. They know what steps to take if they are having difficulty.

Before reading, good readers spend time setting reading goals and deciding what they expect to get from a particular text. They consider the type of text they are to read, then choose the appropriate strategies for approaching it. Rather than diving into reading—starting at the beginning and plodding on to the end—they create a mental overview of the text to determine whether it is relevant to their goals. As part of the overview, they become aware of the structure of the text, activate relevant background knowledge, set purposes for reading, and identify clues, problems, and wonderings. During reading, successful readers are often selective, focusing their attention on the parts of the text most appropriate to their goals or purposes. Efficient readers do not just orient to the literal meaning of the text; rather, they interpret what they are reading, filtering ideas in the text through their prior knowledge and making connections. Such interpretations often include an evaluation of the quality of the ideas in the text. Often, such associations are carried out intentionally; that is, a good reader thinks about how the ideas in the text seem familiar, then recalls where she or he encountered the ideas before or where similar ideas were presented. Readers also make predictions and anticipate what is going to happen next, or what ideas the text will advance. The readers continuously evaluate these predictions and revise them as the reading warrants.

Successful readers are engaged, strategic, and vary their reading speed, sometimes skimming and sometimes rereading a section of text that is especially relevant to their reading goals. As they encounter new ideas during reading, they update their prior knowledge. In addition, they make conscious inferences, such as determining the

author's intentions for writing the text, clarifying the meaning of unknown words, and filling in information if they perceive gaps in an argument. They construct meaning by creating mental images. If, for example, they are reading fiction, they create mental pictures of settings and characters. Successful readers also use various techniques to make a text more memorable. They may underline important sections, make notes to themselves, construct mental images or real images such as graphs and charts to represent the ideas in the text, and/or paraphrase the text. Experienced readers constantly interact with the text in an effort not only to understand and add what they are reading to their knowledge base, but also to use that expanded knowledge to influence and direct their understanding of the text, their underlying knowledge, and their understanding of the world in general.

After reading, good readers often reflect on what they have read and think about how they can apply the ideas conveyed in the text. Many will make mental summaries of major points or events in the reading; others will seek additional information by consulting other sources.

In contrast, poor readers rarely think about text before they start reading. They plod through text, and often give up when frustrated because they feel they have no recourse to help when stumped. Their goal is often to get to the end, not resolve inconsistencies, make connections, and monitor understanding. After reading, poor readers rarely think about or reflect upon what they have read.

### **How should comprehension strategies be taught?**

Effective reading instruction includes specific direct instruction in the use of comprehension strategies and skills coupled with abundant and meaningful practice that mimics real-world reading experiences.

### **Comprehension strategy instruction**

In a classroom, effective comprehension strategies instruction proceeds something like this:

- Teachers remind students that good readers constantly check their understanding as they read. They constantly ask themselves questions about what they read and what it means.
- Teachers introduce strategies through explanation and modeling. As part of reading, teachers identify a strategy that can be applied in reading a particular text, explain why it is used at a specific point in the text, and then model how to apply the strategy through thinking aloud.
- After introducing strategies as suggested in the *Teacher's Edition*, teachers coach students to use the strategies on their own, providing prompts and suggestions about when they might make strategic choices. The prompts and suggestions should decrease as students become skilled in strategy use, with students gradually assuming more and more responsibility for applying strategies.
- Students model strategy use for one another by thinking aloud as they read, for example. They explain to one another how they have used strategies to process and make sense of text.
- Teachers consistently model flexible use of strategies.

The ultimate goal of effective strategies instruction is to have students internalize key strategies to use them automatically and independently.

The repertoire of strategies students learn may vary somewhat in name, but generally includes:

- **Monitoring and clarifying.** Effective readers constantly monitor themselves as they read in order to check their understanding as they are reading. They note the characteristics of the text, such as whether it is difficult to read or whether some sections are more challenging or more important than others. In addition, when good readers are aware that they do not understand, they take appropriate action, such as rereading, in order to understand the text better. As they read, good readers stay alert for problem signs such as loss of concentration, unfamiliar vocabulary, or lack of sufficient background knowledge to comprehend the text. This ability to self-monitor and identify aspects of the text that hinder comprehension is crucial to becoming a proficient reader.
- **Asking questions.** Efficient readers ask questions that may prepare them for what they will learn. If their questions are not answered in the text, they may try to find answers elsewhere and thus add even more to their store of knowledge. Certain kinds of questions occur naturally to a reader, whether they're seeking to clear up any confusion or wondering why something in the text is a certain way. Intentional readers take this

somewhat informal questioning one step further by formulating questions with the specific intent of checking their understanding. They literally test themselves by thinking of questions a teacher might ask and then by determining answers to those questions.

- **Predicting.** Efficient readers predict what will happen next. When reading fiction, they make predictions about what they are reading based on information provided by the author as well as their own background knowledge and then confirm or revise those predictions as they go.
- **Making connections.** Successful readers make connections between what they are reading and what they already know from past experience or previous reading.
- **Visualizing.** Effective readers visualize what is happening in the text. They form mental images as they read. They picture the setting, the characters, and the action in a story. Visualizing helps readers understand descriptions, complex activities, or processes. Visualizing can also be helpful when reading expository text. When a complex process or an event is being described, the reader can follow the process or the event better by visualizing each step or episode. Sometimes an author or editor helps the reader by providing illustrations, diagrams, or maps. If no visual aid has been provided, it may help the reader to create one.
- **Monitoring and adjusting reading speed.** Successful readers understand that not all text is equal. Because of this, good readers continuously monitor what they are reading and adjust their reading speed accordingly. They skim parts of the text that are not important or relevant to their reading goals, and they purposely slow down when they encounter difficulty in understanding the text.
- **Summarizing.** Efficient readers sum up to check their understanding as they read. Sometimes they reread to fill in gaps in their understanding. Good readers use the strategy of summarizing to keep track of what they are reading and to focus on important information or key concepts.

### How should comprehension skills be taught?

#### Comprehension skills instruction

Comprehension skills instruction teaches students how to identify different organizational structures authors use and how to use these structures to retrieve information that will help them better understand a range of text types. The purpose of including comprehension skills instruction as well as strategy instruction is to give students a complete repertoire of tools to help them become more proficient at getting meaning from what they read. Why is skills instruction important? Once students are able to recognize how the information in a given text is organized, they find it easier to follow the organizational pattern and thus to distinguish and focus on the major concepts of the text.

According to Meyer (1984), effective comprehension skills instruction:

- Teaches students to identify a set of organizational structures in text.
- Teaches them that these structures help organize information in a text.
- Teaches them a set of signal words that cue relationships in text.
- Teaches them to ask themselves questions about text relationships as they read.

As with comprehension strategy instruction, instruction in comprehension skills progresses logically:

- Teachers introduce each skill through direct explanation and modeling. As part of rereading a text, teachers identify a skill that can be applied, explain how the skill can be used to read the text, and finally model how to employ the skill through thinking aloud.
- After introducing each skill, teachers remind students to use it on their own, providing prompts about when its use is appropriate.
- Teachers gradually decrease their prompts, allowing students to assume more and more responsibility for employing the skills on their own.
- Teachers limit the number of skills to one or two that can be identified clearly in the selection. Trying to have students concentrate on too many skills will confuse them and make it harder for them to use any of the

skills successfully. If a selection has good examples of several different skills, teachers can return to the selection several times over a span of days.

- Teachers solidify the reading/writing connection by having students incorporate different text structures into their own writing. As they use specific organizational structures in their own writing, students develop a clearer understanding of how to identify these structures as they read.
- Teachers remind students frequently that the purpose of any skill exercise is to give them tools to use as they read and write.

Organizational structure should be systematically and judiciously introduced and should be taught explicitly. Once taught, each structure should be reviewed cumulatively (California Department of Education, 1999). This is not to say, however, that skills instruction should occupy a great deal of class time. Instructional sessions should be concise and always conducted within the context of reading a text.

In addition, skills instruction must alert students to the fact that a particular text type, such as an article in a magazine or a chapter in a novel, may use more than one type of organizational structure to arrange information. That is, skills instruction prepares them to be flexible in their use of comprehension skills, switching from one to another, as required, as they read the text.

The repertoire of solid comprehension skills varies; however, it should include:

- Identifying and considering the author's point of view.
- Identifying and understanding the author's purpose for writing.
- Identifying and understanding cause-and-effect relationships.
- Understanding a sequence of events.
- Comparing and contrasting ideas, characters, and events.
- Classifying and categorizing information.
- Identifying and distinguishing main ideas and supporting details.
- Drawing conclusions and making inferences from what is read.
- Distinguishing fact from opinion.
- Distinguishing fantasy from reality.

Some of these skills—such as identifying cause-and-effect relationships, identifying main ideas, understanding a sequence, comparing and contrasting, and classifying and categorizing—help students organize text information. Others—such as understanding the author's point of view and purpose, drawing conclusions and making inferences, and distinguishing fact from opinion—lead to a deeper understanding of a text, to "reading between the lines," which is a hallmark of successful readers.

## **Conclusion**

It has been more than three decades since Durkin's landmark research revealed that little or no comprehension instruction—much less strategies and skills instruction—was taking place in schools (Durkin, 1978-1979). Since then, a great deal has been learned about the kind of instruction that can help students develop their comprehension. Such instruction ensures that students have adequate preparation in decoding and word recognition skills, provides opportunities for vocabulary growth, helps students develop networks of rich world knowledge, and through explicit teaching, provides extensive opportunities to practice the use of key comprehension strategies and comprehension skills. Most importantly, educators have learned that by teaching students to use a repertoire of comprehension strategies and skills, they can set them securely on the path to becoming lifelong readers—readers in charge of their learning, who can and want to read.