Improving Reading Comprehension in Kindergarten Through 3rd Grade

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The Institute of Education Sciences (IES) publishes practice guides in education to bring the best available evidence and expertise to bear on current challenges in education. Authors of practice guides combine their expertise with the findings of rigorous research, when available, to develop specific recommendations for addressing these challenges. The authors rate the strength of the research evidence supporting each of their recommendations. See Appendix A for a full description of practice guides.

The goal of this practice guide is to offer educators specific evidence-based recommendations that address the challenge of teaching reading comprehension to students in kindergarten through 3rd grade. The guide provides practical, clear information on critical topics related to teaching reading comprehension and is based on the best available evidence as judged by the authors.

Practice guides published by IES are offered on our website at whatworks.ed.gov/publications/practiceguides. Practice guides published to date are shown in the following table.

Practice Guides Published	Relevant for All Grade Levels	Relevant for Elementary School	Relevant for Secondary School
Encouraging Girls in Math and Science *(September 2007)*	◆		
Organizing Instruction and Study to Improve Student Learning *(September 2007)*	◆		
Turning Around Chronically Low-Performing Schools *(May 2008)*	◆		
Using Student Achievement Data to Support Instructional Decision Making *(September 2009)*	◆		
Assisting Students Struggling with Reading: Response to Intervention (RtI) and Multi-Tier Intervention in the Primary Grades *(February 2009)*		◆	
Effective Literacy and English Language Instruction for English Learners in the Elementary Grades *(December 2007)*		◆	
Improving Reading Comprehension in Kindergarten Through 3rd Grade *(September 2010)*		◆	
Reducing Behavior Problems in the Elementary School Classroom *(September 2008)*		◆	
Assisting Students Struggling with Mathematics: Response to Intervention (RtI) for Elementary and Middle Schools *(April 2009)*		◆	◆
Developing Effective Fractions Instruction for Kindergarten Through 8th Grade *(September 2010)*		◆	◆
Improving Adolescent Literacy: Effective Classroom and Intervention Practices *(August 2008)*		◆	◆
Structuring Out-of-School Time to Improve Academic Achievement *(July 2009)*		◆	◆
Dropout Prevention *(August 2008)*			◆
Helping Students Navigate the Path to College: What High Schools Can Do *(September 2009)*			◆

(i)

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September 2010

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What Works Clearinghouse Practice Guide citations begin with the panel chair, followed by the names of the panelists listed in alphabetical order.

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- Teach students how to use several research-based reading comprehension strategies.
- Teach reading comprehension strategies individually or in combination.
- Teach reading comprehension strategies by using a gradual release of responsibility.

Recommendation 2.
Teach students to identify and use the text's organizational structure to comprehend, learn, and remember content.

- Explain how to identify and connect the parts of narrative texts.
- Provide instruction on common structures of informational texts.

Recommendation 3.
Guide students through focused, high-quality discussion on the meaning of text.

- Structure the discussion to complement the text, the instructional purpose, and the readers' ability and grade level.
- Develop discussion questions that require students to think deeply about text.
- Ask follow-up questions to encourage and facilitate discussion.
- Have students lead structured small-group discussions.

Recommendation 4.
Select texts purposefully to support comprehension development.

- Teach reading comprehension with multiple genres of text.
- Choose texts of high quality with richness and depth of ideas and information.
- Choose texts with word recognition and comprehension difficulty appropriate for the students' reading ability and the instructional activity.
- Use texts that support the purpose of instruction.

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Establish an engaging and motivating context in which to teach reading comprehension.

- Help students discover the purpose and benefits of reading.
- Create opportunities for students to see themselves as successful readers.
- Give students reading choices.
- Give students the opportunity to learn by collaborating with their peers.

Acknowledgments

Institute of Education Sciences Levels of Evidence for Practice Guides

This section provides information about the role of evidence in Institute of Education Sciences' (IES) What Works Clearinghouse (WWC) practice guides. It describes how practice guide panels determine the level of evidence for each recommendation and explains the criteria for each of the three levels of evidence (strong evidence, moderate evidence, and minimal evidence).

The level of evidence assigned to each recommendation in this practice guide represents the panel's judgment of the quality of the existing research to support a claim that when these practices were implemented in past research, positive effects were observed on student outcomes. After careful review of the studies supporting each recommendation, panelists determine the level of evidence for each recommendation using the criteria in Table 1. The panel first considers the relevance of individual studies to the recommendation and then discusses the entire evidence base, taking the following into consideration:

- the number of studies

- the quality of the studies

- whether the studies represent the range of participants and settings on which the recommendation is focused

- whether findings from the studies can be attributed to the recommended practice

- whether findings in the studies are consistently positive

A rating of *strong evidence* refers to consistent evidence that the recommended strategies, programs, or practices improve student outcomes for a wide population of students.[1] In other words, there is strong causal and generalizable evidence.

A rating of *moderate evidence* refers either to evidence from studies that allow strong causal conclusions but cannot be generalized with assurance to the population on which a recommendation is focused (perhaps because the findings have not been widely replicated) or to evidence from studies that are generalizable but have some causal ambiguity. It also might be that the studies that exist do not specifically examine the outcomes of interest in the practice guide although they may be related.

A rating of *minimal evidence* suggests that the panel cannot point to a body of research that demonstrates the practice's positive effect on student achievement. In some cases, this simply means that the recommended practices would be difficult to study in a rigorous, experimental fashion;[2] in other cases, it means that researchers have not yet studied this practice, or that there is weak or conflicting evidence of effectiveness. A minimal evidence rating does not indicate that the recommendation is any less important than other recommendations with a strong evidence or moderate evidence rating.

In terms of the levels of evidence indicated in Table 1, the panel relied on WWC evidence standards to assess the quality of evidence supporting educational programs and practices. The WWC evaluates evidence for the causal validity of instructional programs and practices according to WWC standards. Information about these standards is available at http://ies.ed.gov/ncee/wwc/pdf/wwc_procedures_v2_standards_handbook.pdf. Eligible studies that meet WWC evidence standards or meet evidence standards with reservations are indicated by **bold text** in the endnotes and references pages.

Table 1. Institute of Education Sciences levels of evidence for practice guides

Strong Evidence

In general, characterization of the evidence for a recommendation as *strong evidence* requires both studies with high internal validity (i.e., studies whose designs can support causal conclusions) and studies with high external validity (i.e., studies that in total include enough of the range of participants and settings on which the recommendation is focused to support the conclusion that the results can be generalized to those participants and settings). Strong evidence for this practice guide is operationalized as

- A systematic review of research that generally meets WWC standards (see http://ies.ed.gov/ncee/wwc/) and supports the effectiveness of a program, practice, or approach with no contradictory evidence of similar quality; OR

- Several well-designed, randomized controlled trials or well-designed quasi-experiments that generally meet WWC standards and support the effectiveness of a program, practice, or approach with no contradictory evidence of similar quality; OR

- One large, well-designed, randomized controlled, multisite trial that meets WWC standards and supports the effectiveness of a program, practice, or approach with no contradictory evidence of similar quality; OR

- For assessments, evidence of reliability and validity that meets the Standards for Educational and Psychological Testing.[3]

Moderate Evidence

In general, characterization of the evidence for a recommendation as *moderate evidence* requires studies with high internal validity but moderate external validity or studies with high external validity but moderate internal validity. Moderate evidence is derived from studies that support strong causal conclusions, but generalization is uncertain, or studies that support the generality of a relationship, but the causality is uncertain. Moderate evidence for this practice guide is operationalized as

- Experiments or quasi-experiments generally meeting WWC standards and supporting the effectiveness of a program, practice, or approach with small sample sizes and/or other conditions of implementation or analysis that limit generalizability and no contrary evidence; OR

- Comparison group studies that do not demonstrate equivalence of groups at pretest and, therefore, do not meet WWC standards but that (1) consistently show enhanced outcomes for participants experiencing a particular program, practice, or approach and (2) have no major flaws related to internal validity other than lack of demonstrated equivalence at pretest (e.g., only one teacher or one class per condition, unequal amounts of instructional time, highly biased outcome measures); OR

- Correlational research with strong statistical controls for selection bias and for discerning influence of endogenous factors and no contrary evidence; OR

- For assessments, evidence of reliability that meets the Standards for Educational and Psychological Testing[4] but with evidence of validity from samples not adequately representative of the population on which the recommendation is focused.

Minimal Evidence

In general, characterization of the evidence for a recommendation as *minimal evidence* means that the recommendation is based on expert opinion derived from strong findings or theories in related areas and/or expert opinion buttressed by direct evidence that does not rise to the moderate evidence or strong evidence levels. Minimal evidence is operationalized as evidence not meeting the standards for the moderate evidence or strong evidence level.

Introduction

Introduction to the *Improving Reading Comprehension in Kindergarten Through 3rd Grade* Practice Guide

This section provides an overview of the importance of improving reading comprehension in kindergarten through 3rd grade and explains key parameters considered by the panel in developing the practice guide. It also summarizes the recommendations for readers and concludes with a discussion of the research supporting the practice guide.

Strong reading comprehension skills are central not only to academic and professional success, but also to a productive social and civic life.[6] These skills build the capacity to learn independently, to absorb information on a variety of topics, to enjoy reading, and to experience literature more deeply. Despite the growing demand for highly educated workers in today's information- and service-related economies,[7] the proportion of American adults classified as "below basic" readers remained remarkably constant between 1992 and 2003.[8] This guide, developed by a panel of experts, presents a set of evidence-based practices that teachers and other educators can use to successfully teach reading comprehension to young readers. The panel believes that students who read with understanding at an early age gain access to a broader range of texts, knowledge, and educational opportunities, making early reading comprehension instruction particularly critical. The guide also describes the evidence that supports the practices and gives examples of how they can be implemented in the classroom.

The fundamental assumption in this guide is that the objective of reading instruction is to give young readers the tools they need to understand increasingly sophisticated material in all subjects from elementary through later years of school. The practices recommended in this guide are therefore not an end in themselves, but the means to developing sound ability in reading comprehension. For example, a story map is a useful tool only if it helps students to follow a storyline more fully and accurately. With this principle in mind, teachers should prepare their reading lessons in a way that encourages students to use the tools to enhance comprehension adeptly and

> ### Defining reading comprehension
> The panel selected a definition of reading comprehension that emphasizes both what the author has written and readers' ability to use their background knowledge and thinking ability to make sense of what they read. The panel defines reading comprehension as "the process of simultaneously extracting and constructing meaning through interaction and involvement with written language."[5] Extracting meaning is to understand what an author has stated, explicitly or implicitly. Constructing meaning is to interpret what an author has said by bringing one's "capacities, abilities, knowledge, and experiences" to bear on what he or she is reading. These personal characteristics also may affect the comprehension process.

independently as they read. The examples in the guide should not, however, be construed as either the only or the most effective ways to put each recommendation into practice. They are intended to illustrate practices that have been used successfully to teach reading comprehension.

Scope of the practice guide

Audience and Grade Level. This guide is intended for teachers, reading coaches, principals, and other educators. It focuses on reading comprehension abilities that may be taught specifically to students in kindergarten through 3rd grade. Most research on improving reading comprehension concentrates on the upper grades, in which it is a more salient part of the curriculum.[9] The panel, however, believes that the teaching of reading comprehension should begin in kindergarten and elementary school. That said, the panel acknowledges that instructional practices in kindergarten or early 1st grade, when

students are beginning to read, can and will differ from practices in 2nd or 3rd grade, when students exhibit more mastery over language. Consequently, the recommendations may need to be adapted to students of different ages or at different reading levels.

Content. Reading requires a rich and complex array of abilities that enable comprehension, not all of which are specifically reading comprehension skills. For example, successful decoding undergirds successful reading comprehension, and it certainly should be taught, but the panel believes decoding instruction alone will not produce desired levels of reading comprehension for all students. The current research on reading indicates that the following types of skills and knowledge are critical to building a young student's capacity to comprehend what he or she reads:

1. **Word-level skills** allow students to identify, or decode, words in text accurately and fluently. Instruction in this area includes phonemic awareness, word analysis strategies (especially phonemic decoding), sight word vocabulary, and practice to increase fluency while reading.

2. **Vocabulary knowledge and oral language skills** help readers understand the meaning of words and connected text. Instruction in this area involves strategies to build vocabulary and activities to strengthen listening comprehension.

3. **Broad conceptual knowledge** includes not only general knowledge of the world but also knowledge drawn from science, social studies, and other disciplines. An information-rich curriculum can help students develop the background that is necessary for good reading comprehension.[10]

4. **Knowledge and abilities required specifically to comprehend text** include an understanding of the different ways text can be structured and the ability to use a repertoire of cognitive strategies.

5. **Thinking and reasoning skills** that are involved, for example, in making inferences are essential to reading comprehension as text becomes more complex and as a student's tasks depend more on the thoughtful analysis of content.

6. **Motivation to understand and work toward academic goals** makes it more likely that students will intentionally apply strategies to improve their reading comprehension. Comprehending complex text requires active mental effort, which is most likely to occur when a student is engaged in the task at hand.

Acknowledging the plethora of instructional demands that teachers must address in the early primary grades, this guide focuses on the last three areas, which represent explicit instruction in reading comprehension. The panel believes that these should be taught and fostered, along with the first three, right from the start rather than waiting until the word-level skills are firmly established. This belief is encouraged by research suggesting that proficiency in reading comprehension depends on the ability to bring the skills in all six areas to bear on the reading process itself.[11] The panel therefore encourages educators to create learning opportunities that prompt students to draw on some combination of all six areas as they read.

The following factors are not discussed in this guide because the material appears in earlier guides or because of space limitations. However, the panel believes that these considerations are important when planning for reading comprehension instruction.

- **Special Populations.** The panel did not consider instructional practices that had been evaluated only for use with learning-disabled students, special-education students, students with an Individualized Education Program, or English language learners. Practices used with struggling and at-risk readers are included. However, the panel believes that the practices

recommended in this guide are applicable to all of these special populations and knows of no evidence to the contrary. On the other hand, the amount, intensity, and duration of instruction may need to vary for such students. For other resources on working with these students, the panel refers readers to two prior What Works Clearinghouse (WWC) practice guides: *Effective Literacy and English Language Instruction for English Learners in the Elementary Grades* and *Assisting Students Struggling with Reading: Response to Intervention (RtI) and Multi-Tier Intervention in the Elementary Grades.*

- **Assessment.** Students vary in their development of reading comprehension skills, and the panel believes that teachers must adjust instruction or differentiate instruction based on assessments of student progress. In fact, teachers should view all their interactions with students as an opportunity for informal assessment. This can include asking students to summarize or retell what they have read, asking them to write about their response to the text, and observing their contributions to discussions about the text. The panel refers readers to the WWC practice guide *Using Student Achievement Data to Support Instructional Decision Making* for more information on using student data to inform instructional choices.

- **Graphic Literacy.** A student's ability to comprehend graphics *within a text* is critical to reading comprehension and can be taught, but comprehension of graphics independent of text is not the focus of this guide.

Evidence. In making its recommendations, the panel looked for evidence that instructional practices caused or led to improvements in reading comprehension when students were reading texts that had not been part of the instruction. To deem an instructional practice effective, the panel members looked for changes in outcome measures showing that students demonstrated improved

comprehension when reading independently (i.e., without teacher assistance) relative to similar peers who had not been exposed to the instructional practice.

Although listening comprehension remains a strong predictor of reading comprehension after 1st grade,[12] most students can read words independently from the 2nd grade onward. Therefore, the panel judged the evidence for 2nd- and 3rd-grade students on the basis of outcome measures for reading comprehension only, and for kindergarteners and 1st-grade students on the basis of outcome measures for listening comprehension when reading comprehension outcomes were not available.

Summary of the recommendations

The five recommendations in this guide promote practices that have shown promise in increasing reading comprehension among students in kindergarten through 3rd grade.

- **Recommendation 1** encourages teachers to teach students a variety of strategies that will help them understand and retain what they read and thus become independent, resourceful readers.

- **Recommendation 2** is about how to teach young readers to recognize how a text is organized, or "structured." Authors structure texts in a variety of ways to get their point across. Recognizing text structure can build students' understanding of what they are reading and improve their ability to recall it.

- **Recommendation 3** suggests that teachers discuss the text with students to improve their reading comprehension. This approach will allow young readers to more deeply explore the ideas in the text they are reading. In guiding the discussion, teachers should model ways to think about the text that can help students when they are reading independently.

- **Recommendation 4** emphasizes the importance of choosing texts that specifically support the goals of teaching and improving reading comprehension.

- **Recommendation 5** outlines how teachers can motivate students to improve their efforts to comprehend text. Constructing meaning while reading can be demanding intellectual work, and teachers who hold their students' interest may be more effective in helping them to develop good reading comprehension skills.

To be successful, these five recommendations must be implemented in concert, and clearly explained in a rich educational context that includes the following: a comprehensive literacy curriculum, ample opportunity for students to read and write while being coached and monitored by teachers, additional instruction and practice for students based on the results of formal and informal assessments, and adequate resources for students and teachers.

Use of research

The research base for this guide was identified through a comprehensive search for studies that evaluated practices designed to improve reading comprehension for beginning readers. It includes both experimental and quasi-experimental effectiveness studies as well as qualitative reports of practices and strategies. An initial search for studies conducted in English-speaking settings in the past 20 years (1989–2009) and additional highly relevant studies prior to 1989 recommended by the panel yielded 812 citations.

Of the 812 original studies, 27 met WWC standards with or without reservations and represent the strongest evidence of the effectiveness of the practices recommended in this guide. Although in the preparation of this guide an extensive review of research was conducted into the teaching of reading comprehension to young children, the guide is not meant as a complete or exhaustive summary of all of the findings of such studies. The panelists, through their expertise and experience, used their collective judgment to determine the most valuable recommendations that could be made on this topic, and the guide then shows how the research evidence supports those particular recommendations.

Studies that met WWC standards were used to assess whether a recommendation was supported by moderate evidence or strong evidence. Studies that potentially met or did not meet WWC standards were used when appropriate to provide additional detail on how recommended practices could be implemented. Studies that provided information on how the guide's five recommendations have been applied in different instructional settings (e.g., at different grade levels) were especially informative. The panel also relied on support for the recommendations from their own teaching and research experience.

Table 2 shows each recommendation and the strength of the evidence that supports it as determined by the panel.

Some of the studies focused on the effectiveness of combinations of practices. This bundling of practices presents challenges when reviewing levels of evidence because evidence of the impact of a group of practices on reading comprehension cannot, with any certainty, be attributed to any one of the specific practices in that combination. The panel members therefore identified promising practices in each group on the basis of their own expert judgment and the similarity of the practices to those that were the sole focus of other studies.

The evidence for two of the five recommendations in this guide is rated as minimal. Nevertheless, the panel believes that these recommendations hold promise for the development of the deeper understanding and critical thinking that enhances reading comprehension. The evidence for Recommendation 3, which describes how to plan and facilitate a discussion about text to improve reading comprehension, is rated as minimal evidence

for two reasons: (1) few studies tested the practice with students in kindergarten through 3rd grade and (2) no studies that tested the effectiveness of this recommendation met WWC evidence standards. The evidence for Recommendation 4 includes only one study of effectiveness that met WWC standards, and the study did not test all aspects of the recommendation. Although the level of evidence ratings are minimal, the panel members have included them among the five recommended practices because they believe they have the potential for stimulating improvement in reading comprehension in students from kindergarten through 3rd grade.

Following the recommendations and suggestions for carrying out the recommendations, Appendix D presents more information on the research evidence that supports each recommendation.

Table 2. Recommendations and corresponding levels of evidence

Recommendation	Levels of Evidence		
	Minimal Evidence	Moderate Evidence	Strong Evidence
1. Teach students how to use reading comprehension strategies.			◆
2. Teach students to identify and use the text's organizational structure to comprehend, learn, and remember content.		◆	
3. Guide students through focused, high-quality discussion on the meaning of text.	◆		
4. Select texts purposefully to support comprehension development.	◆		
5. Establish an engaging and motivating context in which to teach reading comprehension.		◆	

Teach students how to use reading comprehension strategies.

Good readers use many forms of thinking and analyzing text as they read. It is therefore important to teach beginning readers strategies for constructing meaning from text.[13] A strategy is the intentional application of a cognitive routine by a reader before, during, or after reading a text (see box on page 11). Comprehension strategies help readers enhance their understanding, overcome difficulties in comprehending text, and compensate for weak or imperfect knowledge related to the text. The strategies may be taught one by one or in combination. Both approaches can improve reading comprehension, so the panel recommends that teachers choose the approach they are most comfortable with in the classroom.

Teachers should also help students learn how to use comprehension strategies independently through the gradual release of responsibility.[14] When releasing responsibility to students, however, be mindful that students differ in the extent of modeling or support they need from teachers in order to use strategies effectively.

Summary of evidence: Strong Evidence

The panel identified 10 studies that demonstrated that teaching reading comprehension strategies to primary grade students has positive effects on comprehension when measured by standardized tests and researcher-created measures.[15] The specific strategies discussed in this recommendation can improve comprehension when taught individually or in combination with other effective comprehension strategies.

The findings from the 10 studies are summarized below by strategy. See Appendix D for more details on these and other studies that the panel used to develop the recommendation.

- **Activating prior knowledge or predicting** was found to impact reading

comprehension positively in five studies.[16] Even so, only one study evaluated how teaching this strategy alone—relative to not teaching any strategy—affected reading comprehension.[17] The other four studies tested the effectiveness of teaching students to activate prior knowledge or predict in combination with other practices or other comprehension strategies.

- **Questioning** was not examined individually by any of the studies, but four studies reported positive effects on reading comprehension when it was taught along with other strategies.[18]

- **Visualization**, examined by two studies, was found to result in large and statistically significant gains in comprehension. One study tested the effectiveness of visualization alone,[19] whereas the other tested it as part of a package of multiple strategies.[20]

- **Monitoring, clarifying, or fix-up** strategies were evaluated in three studies as part of a package of multiple strategies.[21] Positive effects on comprehension were found for instruction that included these strategies. No studies specifically isolated the effects of these strategies.

- **Inference** training was examined alone in one study,[22] and in combination with other strategies in two additional studies.[23] All three studies found positive effects on reading comprehension for students who received inference training.

- **Retelling** was found by four studies to have positive effects on comprehension,[24] although only one of the four focused closely on retelling as a key component of the instructional practices it tested.[25] The other four studies tested the effectiveness of teaching students to retell in combination with other comprehension strategies.

Several studies examined the effectiveness of approaches that teach multiple comprehension strategies. Two studies found that for students who struggle to understand what

> **"Is this strategy instruction?"**
>
> What the panel refers to as "strategies" are not the same as comprehension skills typically listed in core reading programs, nor are they teaching activities.
>
> **What a strategy is:**
>
> - Intentional mental actions during reading that improve reading comprehension.
> - Deliberate efforts by a reader to better understand or remember what is being read.
>
> **What a strategy is not:**
>
> - Instructional activities such as completing worksheets. Worksheets rarely include instruction in what students should do actively in their heads to improve comprehension.
> - Exercises that are aimed at giving students practice with skills such as sequencing or drawing conclusions, but that lack explicit instruction in how to think in these ways during reading.

they read, teaching multiple comprehension strategies and instructing them to choose among the ones they know improve their reading comprehension.[26] Another study found that students who were quickly taught multiple strategies along with an explanation of how to select and apply them and then were offered an extended period to use them in combination had better reading comprehension than did students who were taught a number of individual strategies more slowly without either an explanation of how to connect them or designated opportunities to use them in combination.[27]

The panel believes that teaching strategies with a gradual release of responsibility facilitates strategy learning; however, there is no strong causal evidence that strategy instruction that uses gradual release of responsibility to students improves comprehension any more than strategy instruction without gradual release. Three studies examined multiple-strategy instruction that involved gradual release of responsibility, but neither study tested specifically for the effectiveness of the gradual release of responsibility.[28]

How to carry out the recommendation

1. Teach students how to use several research-based reading comprehension strategies.

Teachers should explain to students how to use several strategies that have been shown to improve reading comprehension because different strategies cultivate different kinds of thinking. The panel believes that six strategies that improve reading comprehension, described in Table 3, are the most important for reading comprehension in the primary grades. Teachers should explain how the strategies can help the students learn from text—as opposed to having them memorize the strategies—and how to use the strategies effectively.

Table 3. Examples of effective reading comprehension strategies

Effective Strategy	Description	Activities to Promote Strategy Practice[29]
Activating Prior Knowledge/ Predicting	Students think about what they already know and use that knowledge in conjunction with other clues to construct meaning from what they read or to hypothesize what will happen next in the text. It is assumed that students will continue to read to see if their predictions are correct.	1. Pull out a main idea from the text and ask students a question that *relates the idea to their experience*. Ask them to predict whether a similar experience might occur in the text. 2. Halfway through the story, ask students to *predict what will happen* at the end of the story. Have them explain how they decided on their prediction, which encourages them to make inferences about what they are reading and to look at the deeper meaning of words and passages.
Questioning	Students develop and attempt to answer questions about the important ideas in the text while reading, using words such as *where* or *why* to develop their questions.	1. Put words that are used to formulate questions (e.g., *where, why*) on index cards, and distribute to students. 2. Have students, in small groups, ask questions using these words.
Visualizing	Students develop a mental image of what is described in the text.	1. Explain to students that visualizing what is described in the text will help them remember what they read. 2. Have students examine objects placed in front of them, and later a picture depicting a scene. Remove the objects and picture, and ask students to *visualize and describe what they saw*. 3. Read a sentence and describe what you see to the students. Choose sections from the text and ask students to practice visualizing and discussing what they see.
Monitoring, Clarifying, and Fix Up	Students pay attention to whether they understand what they are reading, and when they do not, they reread or use strategies that will help them understand what they have read.	1. Relate each strategy to a traffic sign (e.g., stop sign—stop reading and try to restate in your own words what is happening in the text; U-turn—reread parts of the text that do not make sense). 2. Write different reading comprehension strategies on cards with their signs, and have students work in pairs to apply the strategies to *text they do not understand*.

(continued)

Table 3. Examples of effective reading comprehension strategies *(continued)*

Effective Strategy	Description	Activities to Promote Strategy Practice[29]
Drawing Inferences	Students generate information that is important to construct-ing meaning but that is missing from, or not explicitly stated in, the text.	1. Teach students how to look for key words that help them understand text, and demonstrate how they can draw in-ferences from such words. For example, a teacher might show that a passage that mentions "clowns" and "acro-bats" is probably taking place in a circus. 2. Identify key words in a sample passage of text and explain *what students can learn about the passage from those words*.
Summarizing/ Retelling	Students briefly describe, orally or in writing, the main points of what they read.	1. Ask a student to describe the text in *his or her own words* to a partner or a teacher. 2. If a student has trouble doing this, ask questions such as "What comes next?" or "What else did the passage say about [subject]?"

Sources: Appendix D provides more details on studies that tested the effectiveness of these strategies: Beck, Omanson, and McKeown (1982); **Brown et al. (1995)**; **Center et al. (1999)**; **Hansen (1981)**; **McGee and Johnson (2003)**; **Morrow (1984, 1985)**; **Morrow, Pressley, and Smith (1995)**; Morrow, Rand, and Young (1997); **Paris, Cross, and Lipson (1984)**; **Williamson (1989)**. Several other studies were resources for illustrating how to teach these strategies but did not test their effectiveness: **Bramlett (1994)**; **Morrow (1985)**; Paris and Paris (2007); Vaughn et al. (2000).

2. Teach reading comprehension strategies individually or in combination.

Teachers can use single- or multiple-strategy instruction. **Single-strategy** instruction intro-duces each strategy individually and includes practice for some period of time, usually a few weeks, before the next strategy is intro-duced. Over time, students come to master a collection of strategies. It may be easier to begin with single-strategy instruction because it allows the teacher and students to focus on one strategy at a time. However, as additional strategies are introduced, teachers should encourage students to use all the strategies they have learned as they read, because stu-dents may forget previous strategies or stop using them when the next strategy is intro-duced. Table 3 provides examples for classroom activities for single-strategy instruction.

Multiple-strategy instruction introduces several strategies simultaneously, and they are practiced in combination so that readers learn to use them together as they read. The panel does not believe that there is enough evi-dence to advocate the use of multiple-strategy instruction over single-strategy instruction and therefore recommends that teachers choose the approach that is best for their classroom environment. With either approach, though, the goal should be, ultimately, to teach students several strategies. Multiple-strategy instruc-tion might be more complicated initially, but it familiarizes students with using the strategies together from the very beginning, providing a more authentic, strategic reading experience. The panel refers readers to four examples of multiple-strategy formats that combine strate-gies with an explicit method of teaching them (see Table 4). These methods have all been the subject of research.[30]

> **Key reminders**
> - Provide students with a sense of how each strategy is applied and how it differs from other strategies they have learned.[31]
> - Create opportunities for students to read and practice using strategies with peers, with teach-ers, and independently.

Table 4. Examples of multiple-strategy formats[a]

Reciprocal Teaching

Overview: Take turns leading a conversation on the text using four strategies modeled by the teacher. The teacher describes all of the strategies in succession. The teacher then models each strategy in turn and explains why the strategy helps students understand the text. This method usually occurs in small groups.

Typical strategies taught: Predicting, Clarifying, Questioning, and Summarizing. This combination is meant to give students the tools they need to enhance and monitor their own comprehension.

Transactional Strategy Instruction

Overview: Focus on a few strategies at a time, concentrating on improving the students' memory, comprehension, and problem-solving skills. The teacher selects from a large menu of strategies to explicitly teach (see below). Teachers then explicitly teach the strategies by explaining strategy use and processes, modeling the strategy using teaching "think-alouds," assisting in practicing the strategy, and applying the strategy to reading and writing. Teachers should gradually release responsibility to the students (see text in this recommendation on using gradual release of responsibility). Teachers may use these strategies to motivate students to involve themselves in the text and to stimulate a class discussion about the text.

Typical strategies taught: Select from the following: Activating prior knowledge, Predicting, Questioning, Visualizing, Summarizing, Monitoring, Clarifying, Goal setting, Text structure

Informed Strategies for Learning

Overview: Combine a variety of reading comprehension strategies to show students that the strategies they learn are useful and necessary for being able to read with understanding. To begin, teachers can explicitly teach several strategies that will help students to understand what they read. For example, teachers can model how they monitor their own understanding by stopping periodically and asking themselves whether they understand what they just read. When combining this strategy with others, teachers can display a bulletin board linking each strategy to a picture or themed metaphor (e.g., various road signs) representing how to put each into practice (in the previous example, a stop sign might remind students to stop and monitor their own understanding). The board serves as a reminder during lessons and while students read independently. Teachers encourage students to be aware of what they are reading, and students continually monitor and evaluate their own understanding.

Typical strategies taught: Activating prior knowledge, Drawing inferences, Visualizing, Summarizing, Monitoring

Concept Oriented Reading Instruction

Overview: Teach comprehension strategies in the context of learning about an overarching concept, typically in the natural sciences, in order to engage students and motivate them to learn (Recommendation 5 describes the motivational components of this format). Teachers introduce one strategy per week, systematically integrating the strategies in later weeks. Teachers can bring in other instructional practices, including hands-on activities, collaborative learning activities, and offering students some choice in and control over what they learn.

Typical strategies taught: Activating prior knowledge, Questioning, Summarizing, Text structure

Sources: Reciprocal Teaching: Palinscar (1986); **Sarasti (2007)**; **Dandeles (1996)**; **Williamson (1989)**. Transactional Strategy Instruction: **Brown et al. (1995)**; Brown and Coy-Ogan (1993); **Reutzel, Smith, and Fawson (2005)**. Informed Strategies for Learning: **Paris, Cross, and Lipson (2004)**. Concept-Oriented Reading Instruction: **Guthrie et al. (2004)**; Swan (2003).

[a] The table presents only a sample of multiple-strategy formats. Some individual strategies, such as goal setting, have not been as widely tested as those the panel recommends. Other approaches, such as the use of text structure, are discussed elsewhere in this guide. Other approaches have been researched but may not have formal names. See Appendix D for details about studies of multiple-strategy formats.

3. Teach reading comprehension strategies by using a gradual release of responsibility.

Because the use of strategies may not come naturally to many young readers, the panel believes that the strategies should be taught through a **gradual release of responsibility**, in which the teacher first explains how to use the strategy and then gives students more and more independence in practicing and applying the strategy over time.[32] Figure 1 illustrates this shift in responsibility from teacher to student. Effective instruction in reading comprehension strategies often includes some or all of the steps in this model.[33]
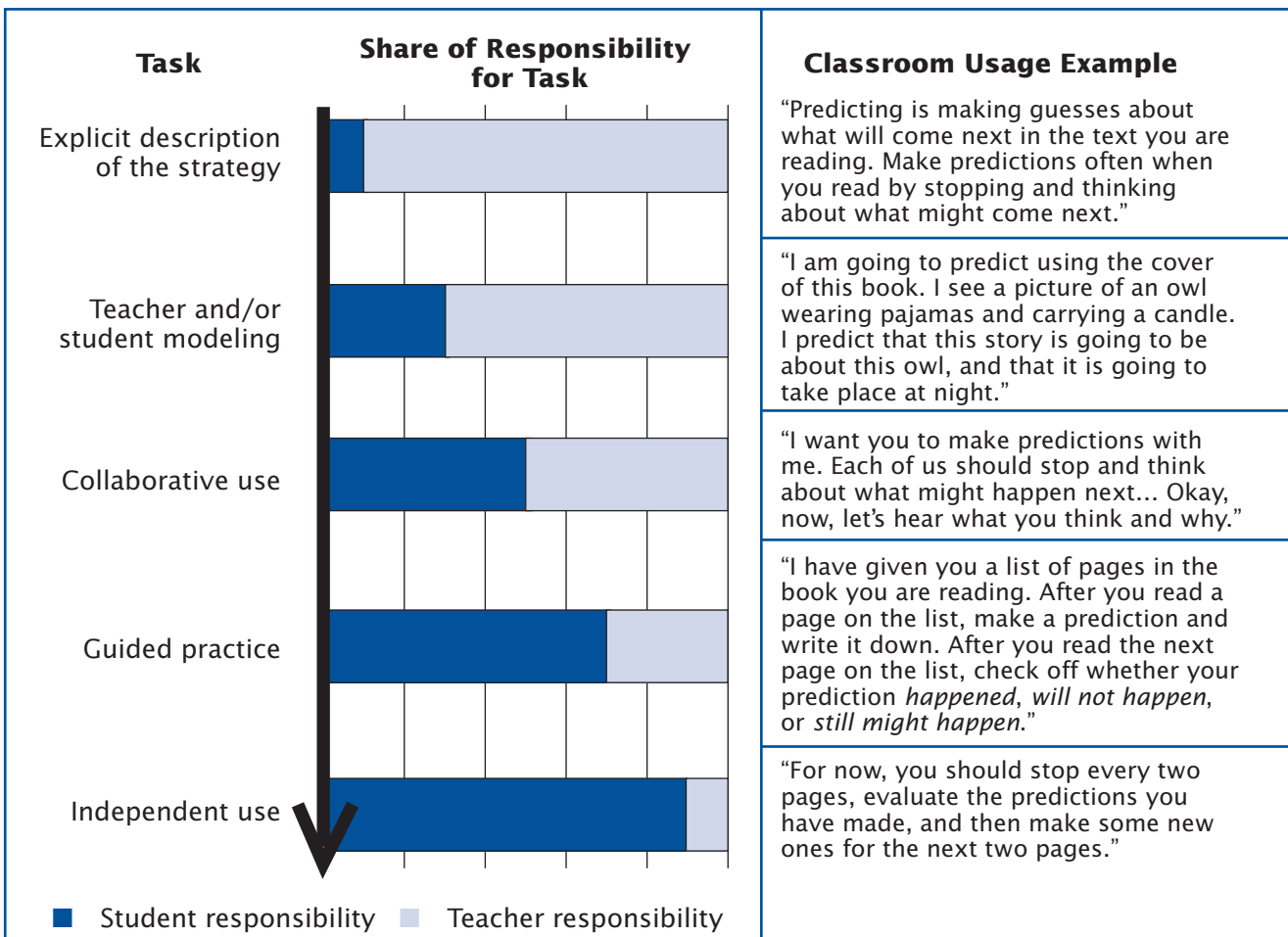
While going through the steps with the class, a teacher should periodically review the purpose of any given strategy and how it improves

Key reminders

- Remind students to use not only the strategy they just learned but also others they already know, and offer tips on when to use the strategies.
- Talk with students about the value of using strategies to understand what they read so that they understand that strategies are important to both the assignment at hand and to reading in general.

comprehension until students can apply it independently while they read. Cycle back through the gradual release process as the text/topics/concepts become more difficult.

Figure 1. Illustration of instructional practices to gradually release responsibility to students as task progresses

Task	Share of Responsibility for Task	Classroom Usage Example
Explicit description of the strategy		"Predicting is making guesses about what will come next in the text you are reading. Make predictions often when you read by stopping and thinking about what might come next."
Teacher and/or student modeling		"I am going to predict using the cover of this book. I see a picture of an owl wearing pajamas and carrying a candle. I predict that this story is going to be about this owl, and that it is going to take place at night."
Collaborative use		"I want you to make predictions with me. Each of us should stop and think about what might happen next… Okay, now, let's hear what you think and why."
Guided practice		"I have given you a list of pages in the book you are reading. After you read a page on the list, make a prediction and write it down. After you read the next page on the list, check off whether your prediction *happened*, *will not happen*, or *still might happen*."
Independent use		"For now, you should stop every two pages, evaluate the predictions you have made, and then make some new ones for the next two pages."

■ Student responsibility   ■ Teacher responsibility

Source: Adapted from Duke and Pearson (2002).
Note: Teachers should modify these examples to best suit students' age and abilities.

Potential roadblocks and solutions

Roadblock 1.1. *A multiple-strategy approach is more elaborate than a single-strategy approach. How will teachers know whether their implementation is correct?*

Suggested Approach. A multiple-strategy approach may require more professional development than a single-strategy approach.[34] Teachers should have an opportunity to see examples of successful multiple-strategy instruction and to try it out with feedback from knowledgeable professionals, including other teachers and coaches with experience using the format. Guides that show teachers how to implement specific multiple-strategy formats in the classroom (such as professional books, manuals, and videos) may also be purchased.

Roadblock 1.2. *The school reading assessment emphasizes comprehension skills (e.g., main idea, drawing conclusions), not strategies.*

Suggested Approach. Although there is nothing wrong with instruction that emphasizes certain types of questions or information in a text, the purpose of teaching reading comprehension strategies is to teach students how to think when they are reading, which in itself will improve their ability to perform well on reading assessments. The panel believes that it is critical for teachers to focus on the strategies described in this recommendation, and that these strategies may help students learn other skills outlined in state and local content standards (also see the *"Is this strategy instruction?"* box on page 11).

Roadblock 1.3. *Students bring to the classroom a wide variety of abilities in reading and reading comprehension, so adapting strategy instruction to an individual student is a challenge.*

Suggested Approach. Teachers should form small groups of students with similar comprehension needs or skills, allowing them to focus targeted help on a few students at a time. For instance, instead of releasing responsibility to all students at once, teachers may want to model a strategy more than once for some students, or lengthen the periods of guided practice while giving feedback to students who are struggling to practice on their own. Breaking down the lesson into smaller sections or reading a smaller section of a text together also can help students who are having trouble comprehending a particular text at the same level as other students.

Teach students to identify and use the text's organizational structure to comprehend, learn, and remember content.

The panel believes that students comprehend and remember content better when they are taught to recognize the structure of a text because it can help them to extract and construct meaning while reading.[36] For instance, understanding how stories are organized helps students to distinguish between major and minor events and predict how a story might unfold.[37] Students can begin to develop a sense of structure as early as kindergarten.[38] Although instruction at that stage is typically based on narrative text,[39] the panel believes that students in the early grades should also be exposed to informational text because its structure can build their understanding and recall of key points (see box for definitions of the types of text).[40] The panel believes teachers should teach students to recognize text structure by gradually releasing responsibility while keeping the goal of independent reading in mind.[41] The idea is to prepare students to draw on what they know about structure to help them understand more complex texts.

Narrative texts portray a story, or sequence of related fictional or nonfictional events involving individuals or fictional characters; in the elementary grades, narrative texts can include historical fiction, fables, and autobiographies.

Informational texts include expository writing, pieces that argue in favor of one position or another, and procedural texts and documents. In the elementary grades, informational texts can include news articles, speeches, and timelines.[35]

Summary of evidence: Moderate Evidence

There is moderate evidence that students who are taught to understand text structure (in combination with other instructional practices) experience larger gains in reading comprehension than do those who are not. This conclusion was supported by three studies that focused on narrative texts, as well as two studies using informational texts.[42]

In combination with other reading practices, two studies found that story-mapping (as well as writing stories from a story map), paying attention to story structure during retelling, and story-writing exercises improved students' comprehension of narrative text.[43] In both studies, the students were exposed to unfamiliar narrative text and were given instruction about clue words.

Studies also support that teaching students about text structure using informational text can improve students' reading achievement and comprehension. For instance, students who were taught cause-and-effect statements and related clue words had better comprehension of informational text compared to students who did not receive this instruction.[44] Instructional approaches with informational text that incorporate multiple comprehension strategies, including text structure instruction, also can be effective.[45]

Although they do not contribute to the evidence rating, additional studies noted by the panel support this recommendation.[46] The panel also cited other publications for examples of how to teach students about text structure and tools that might be useful in conducting the instruction.[47]

How to carry out the recommendation

1. Explain how to identify and connect the parts of narrative texts.

The panel recommends that teachers both model and explain how to identify and understand the aspects in every story that give it meaning and "shape," and engage students in identifying these elements and using them to guide their understanding of the text.[48] Teachers can use their core reading programs to teach students about narrative structures, because these materials traditionally include narrative texts.[49] Class discussions of recently read books should include questions about key elements of the text's structure.[50] The panel recommends that structure first be taught through stories that are familiar to students, such as *Goldilocks and the Three Bears* or *Little Red Riding Hood.* Table 5 lists the main elements of structure in narrative text.

The panel recommends that teachers develop tools, such as simple mnemonics, to help students identify and remember the elements of structure. For example, a teacher might ask students to list out the main elements (setting, characters, plot, problem, resolution) and link each with one of the fingers of one hand.[51] Alternatively, teachers can teach the parts of the story using a story map or other graphic organizer[52] such as (1) a chart to match structure to content, (2) a sequencing activity for younger students in which they rearrange a scrambled list of pictures of major events to accurately represent the sequence in the narrative, or (3) a diagram of the plot that connects major action points within the story.[53] With all of these approaches, the panel stresses that, when introducing these tools, teachers should explain what the tool is, why it is useful, and how to use it.[54] The goal is for students to think about the structure *as they read* and not just when required to use one of these tools.

Teachers should adapt their text structure instruction to the capacity of their students. For kindergarten students, the panel recommends that teachers identify these elements by using simpler clues (e.g., When and where? Who? What happened? How did the story end?).[55] Students who are not yet independent readers can also begin to understand the structure of a narrative from stories that are either read aloud to them (perhaps while they follow along with their own copy) or communicated through graphics.[56]

Table 5. Elements of structure in a narrative text[a]

Element	Description	Example
Characters	Who the story was about	A girl named Little Red Riding Hood, her grandmother, and the wolf
Setting	Where and when the story happened	The forest and Grandmother's cabin, during the day
Goal	What the main character was trying to do	Little Red Riding Hood set out to deliver a basket of food to her sick grandmother.
Problem	Why the main character took certain actions	Little Red Riding Hood was not aware that the wolf had eaten Grandmother.
Plot or Action	What happened to the main character or what she or he did to try to solve a problem	She met the wolf on her way to Grandmother's, and the wolf pretended to be Grandmother.
Resolution	How the problem was solved and how the story ended	A nearby hunter rescued Little Red Riding Hood and her grandmother from the wolf.
Theme(s)	General lessons or ideas	You shouldn't talk to strangers.

Source: The list of elements is drawn from **Baumann and Bergeron (1993)**, **Morrow (1996)**, and Pressley et al. (1990).

[a] Not all stories contain examples of conflict. The panel provides the *Little Red Riding Hood* example to illustrate one option for describing these elements to students. Some students from various cultural backgrounds may not be familiar with certain folktales like this one. Teachers should construct lessons around texts that are best suited to their students.

As students develop, teachers should encourage them to use a wider variety of structural elements, such as multiple conflicts and subplots, as they extract and construct meaning from a story. Students can also practice identifying structural elements by making up their own stories, developing stories from story maps,[57] illustrating each episode in the story, or participating in a dramatic retelling. Teachers can also tailor activities that practice using other reading comprehension strategies (see Recommendation 1) to highlight structural elements such as plot development.[58]

Key reminders

- Teachers should gradually introduce new structural elements in narrative texts while reinforcing elements that already have been taught.[59]
- In some stories, there are multiple events, so students must identify the same structural element more than once. For example, *Little Red Riding Hood* is set in both the woods and Grandmother's house.

2. Provide instruction on common structures of informational texts.

The panel believes that teachers should introduce students not only to the structural elements in narrative text, but also to the common structures of informational, or expository, text (Table 6). Informational text structures typically apply to paragraphs or passages, and the entire text may contain multiple structures.[60]

The panel suggests that teachers use familiar ideas or topics when teaching students about the structure of informational text, and initially use texts that provide clear, easy-to-recognize examples of the structure.[61] Compare and contrast is a good example. A teacher could share a compare and contrast text on different types of pets or on two or three modes

Table 6. Structures of informational text

Structure	Description	Example	Common Clue Words	Sample Activities
Description	What something looks, feels, smells, sounds, tastes like, or is composed of	Characteristics of a hurricane		Have students use the details in a descriptive paragraph to construct an illustration or three-dimensional display.
Sequence	When or in what order things happen	A storm becomes a hurricane	first, then, next, after, later, finally	Assign each student to represent one event in a sequence. Ask the class to line up in order and, starting at the front of the line, to explain or enact their respective events in turn.
Problem and Solution	What went wrong and how it was or could be fixed	Hurricane Katrina destroyed homes and stores, so groups like the Red Cross had to bring food and medicine from other parts of the US	because, in order to, so that, trouble, if, problem	Provide opportunities for students to act out key phases of a passage.
Cause and Effect	How one event leads to another	What happened to the people who lived in Louisiana after Hurricane Katrina	because, therefore, cause, effect, so	Have students match up pictures representing "causes" and "effects" in a game-like activity.
Compare and Contrast	How things are alike and different	How hurricanes are the same as or different from tornadoes	both, alike, unlike, but, however, than	Set out overlapping hula hoops, one to represent each side of the comparison, and have students sort visual representations of each characteristic into the shared and different areas of each hoop.

Source: The list of structures was derived from **Williams et al. (2007)** and Duke (2000). The panel developed the definitions and examples for illustrative purposes.

of transportation and have the students work collaboratively to create a table or Venn diagram detailing the similarities and differences. The teacher can use this example to explain that some texts explore how certain things are similar or different. Students can then work with other texts to decide whether they show how two or more things are the same or different, discuss how they determined this, and create similar tables for those that do.

A teacher should then ask students to identify clue words in a passage—such as *alike, unlike, both, but, however, than*—that signal the use of a certain structure: in this case, compare and contrast.[62] It is again useful to teach early readers about clue words through topics that are familiar to them. Following the earlier example, the students can use a familiar text to locate a given clue word and figure out whether it signals a similarity or difference. The students can then use these words to help them sort the facts in an unfamiliar compare and contrast text and create a table.

Teachers can use a similar process to introduce students to the other common informational text structures listed in Table 6. Teachers often instruct students to organize information from expository text by using graphic tools (e.g., concept maps, Venn diagrams, fishbone charts, and sequence diagrams or flow charts). The panel advocates this approach. Table 6 includes descriptions of activities that teachers can use to practice applying a text's structure to organize information, including ones that utilize graphic tools.

Once students can comfortably identify the structure of a passage and recall its content, a teacher can replace leading questions ("What was the cause? What was the effect?") with more complex questions that do not include clue words,[63] such as "How did the author organize the information in this text?"

Potential roadblocks and solutions

Roadblock 2.1. *Teachers may not have time to analyze texts to determine how they are structured and how learning that structure contributes to students' reading comprehension.*

Suggested Approach. Teachers should use common lesson-planning time to collaborate on developing lists of texts that offer clear examples of particular structures and structural elements as well as clue words. Through this kind of collaboration, teachers can teach students about structure through a broader range of texts than if they were working alone, and the knowledge can be spread across many teachers and used in subsequent years. The school library may also have trade books for teachers that identify texts that are good choices to teach particular elements.

Roadblock 2.2. *Students can apply text structure knowledge in classroom assignments but may not do so independently or with more complex texts.*

Suggested Approach. Teachers should encourage students to pay attention to text structure across a wide variety of reading experiences. Students who can use text structure successfully during a reading lesson may forget to do so when reading a social studies book or reading on their own. It can help to provide a quick reminder of the value of structure just as such reading is about to begin. Also, teachers should encourage students to bring them any texts whose structure they cannot figure out. Teachers could use such opportunities to clarify structure and help students to resolve problems with more complex texts.

Guide students through focused, high-quality discussion on the meaning of text.

The panel recommends that teachers lead their students through focused, high-quality discussions in order to help them develop a deeper understanding of what they read. Such discussions among students or between the students and the teacher go beyond simply asking and answering surface-level questions to a more thoughtful exploration of the text. Through this type of exploration, students learn how to argue for or against points raised in the discussion, resolve ambiguities in the text, and draw conclusions or inferences about the text.

The panel believes that students in kindergarten through 3rd grade are capable of having this kind of a discussion if they have appropriate guidance from their teacher. That said, some of the suggestions for putting this recommendation into practice apply to more experienced readers, but the panel believes that teachers can make the suggestions applicable to very early readers and those reading below grade level. For example, teachers can use read-alouds, shared reading, or pictures paired with text for less developed readers. Teachers can also choose texts (see Recommendation 4) and discussion questions that vary in complexity.

Four factors contribute to the success of a discussion. The first two are related to

planning. Teachers should select texts that are compelling enough to spark a discussion. Teachers should also create a discussion guide consisting of "higher-order" questions that prompt students to think more deeply about the text and articulate key aspects of the story. The second two are related to sustaining and expanding the discussion. If higher-order questions are challenging for students, teachers can use follow-up questions to point them in the right direction. Teachers can also split the class into smaller groups and ask students to discuss the text among themselves, checking in on them periodically to ensure that they are on the right track. This approach can build students' ability to think more critically and independently about what they read.

Summary of evidence: Minimal Evidence

There is minimal evidence that participating in high-quality discussion improves reading comprehension for the target population; most studies on using discussions either observed older students or were not designed to conclusively prove the effectiveness of such discussions. Despite this, the panel believes these types of discussions are critical tools for helping students understand what they read. The use of discussion in teaching has a long history, and the panel is aware of extensive evidence of its effectiveness with older learners. Thus, the lack of evidence supporting this practice with younger students is because the claim has rarely been tested empirically and not because studies have failed to find discussion to be effective. For these reasons, and drawing on the panelists' own experiences in working with and observing the learning of young children, the panel believes this to be an important recommendation.

Three studies examined instructional programs that emphasized discussion in kindergarten through 3rd grade; however, they could not show that discussions led to better reading comprehension.[64] One, a study of Transactional Strategies Instruction in which peer-led discussions were used in teaching comprehension strategies, showed that 2nd graders exposed to this technique had better comprehension outcomes than did those who were not.[65] However, it was impossible to separate the effects of discussion on reading comprehension from the effects of the other strategies that were "bundled" with discussion in the intervention. The two other studies that tested the effectiveness of discussions in this age range were missing information needed to demonstrate that discussion leads to improved comprehension.

Four additional studies used correlational designs that suggest a positive association between higher-order questions and reading comprehension.[66] Two of these four studies focused exclusively on students in 3rd grade and higher.[67] These studies provided some insight into relevant instructional practices and how using higher-order questions during reading instruction may be related to improvements in reading comprehension, but they could not show that asking students higher-order questions about text results in better reading comprehension.

How to carry out the recommendation

1. Structure the discussion to complement the text, the instructional purpose, and the readers' ability and grade level.

Teachers should consider how the type and content of the text will affect the discussion they plan to hold. The text used will affect the goals of a discussion, the extent to which students are interested in the discussion, and the questions teachers use to stimulate discussion. A text is more likely to prompt a rich discussion if it features either a character who faces a conflict or a real-world problem that presents a dilemma, because both give students an opportunity to support one side of an issue or the other (see Recommendation 4 for more details on selecting text for instruction).[68]

Discussions and questions should be grounded in state and national comprehension standards. Many state standards for younger students incorporate versions of the National Assessment of Educational Progress (NAEP) standards, which include three categories of comprehension: locate and recall, integrate and interpret, and critique and evaluate (Table 7).[69]

Teachers can use these categories to frame discussion about text. Believing that high-quality discussions should address all three categories, the panel provides guidance below on how each category can be approached.

Table 7. Description of NAEP categories of comprehension

Category of Comprehension	Description
Locate and Recall	Identify the main ideas and supporting details; find elements of a story; focus on small amounts of text
Integrate and Interpret	Compare and contrast information or actions by characters; examine connections across parts of text; consider alternatives to what is presented in the text; use mental images
Critique and Evaluate	Assess text from numerous perspectives, synthesizing what is read with other texts and other experiences; determine what is most significant in a passage; judge whether and the extent to which certain features in the text accomplish the purpose of the text; judge either the likelihood that an event could actually occur or the adequacy of an explanation in the text

Source: Categories of comprehension and their descriptions are drawn from the *Reading Framework for the 2009 National Assessment of Educational Progress*, National Assessment Governing Board (2008), where they are referred to as "cognitive targets."

- **Locate and Recall.** In discussion, the teacher and students should ask questions about what the text means, what the main idea is, and which details support that idea. Before the discussion, the teacher might prepare a guide for the class that highlights which questions students should ask and which the teacher should ask.[70] Teachers should ask some questions and moderate the discussion, but students should do most of the talking.

- **Integrate and Interpret.** In discussion, the teacher begins by reminding students of the comprehension strategies they already know (see Recommendation 1). The teacher then asks the students to read a small portion of the text themselves.

Adapting for younger students
- Take a greater role by asking more questions when working with younger students.
- Explicitly model how to think about the question. For example, the teacher could say: "The question asks about what koalas eat. I am going to look for a heading that talks about food or eating. Headings are these larger, bold-face words that tell us what a part of the text is about. Here's a heading that says 'Food for Koalas.' I am going to read that section. I think it will tell me what koalas eat."

Adapting for younger students
- Read aloud and ask students periodically about what's happening, what the story is about, or what they think is going to happen.
- Facilitate a discussion by using a variety of higher-level questions that prompt the students to interpret the text.

When they are finished, the teacher leads a discussion about what they just read, and so on throughout the entire text. The questions asked by the teacher should lead the students to summarize what happens in the text and to interpret these events in light of their own experience, knowledge, or other parts of the text.[71]

- **Critique and Evaluate.** For discussion, the teacher assigns a text that poses a dilemma about which students might disagree, such as the appropriateness of a particular character's actions or whether the outcome of a story seems realistic. The teacher then divides students into teams according to the opinions they express after they read the text. Each team is asked to pick out parts of the text that support its opinion (e.g., events that make the outcome seem realistic or unrealistic). To facilitate this process, the teacher could

distribute sticky notes to students and ask them to mark these points in the text. Students could also mark text that they think is confusing, and teachers could use this material as the basis of a class discussion about what information is needed to make the text easier to understand.

> **Adapting for younger students**
>
> Read a selection aloud, and have students discuss it with a partner and then report back to the class. To start a discussion at that point, the teacher can ask students whether they think the character did the right thing.

2. Develop discussion questions that require students to think deeply about text.

Teachers should develop higher-order questions that encourage students to think deeply about what the text means rather than simply recalling details.[72] Questions should reflect what teachers want students to draw from the text, including implicit as well as explicit information. They generally should not be simplistic ("What is the boy's name?") or ask just for an opinion ("Did you like the story?"). Typical higher-order questions include

- Why did _____?

- What do you think _____ ?

- If you were the author _____?

- What does _____ remind you of and why?

Table 8 shows sample higher-order questions linked to the NAEP's three categories of comprehension.

When preparing questions, teachers should think about the following: the best time to present each question to students—before, during, or after reading;[73] which questions should be asked when students first read the text;[74] and which questions should be asked after a second or subsequent reading. In a similar vein, teachers should determine exactly where in the text a question will be asked (e.g., after a specific page, paragraph, or illustration). For students in kindergarten and 1st grade, shared reading time or read-alouds provide an opportunity to introduce higher-order questions that invite discussion.

> **Adapting for younger students**
>
> These types of questions can be adapted to students in kindergarten through 3rd grade, but teachers of students in kindergarten or 1st grade who are just becoming familiar with these types of questions may have to ask more follow-up questions (see step 3, below) to clarify what in the text led the students to respond as they did.
>
> Specifically, younger students may find it difficult to take on the viewpoint of the author or a specific character. Teacher guidance can help them recognize and appreciate those viewpoints, drawing on the empathy that children have at this age.

3. Ask follow-up questions to encourage and facilitate discussion.

Reading comprehension improves when teachers ask follow-up questions that encourage students to apply the reading comprehension strategies they know. The questions should be asked in the context of a curriculum in which students are taught comprehension strategies as described in Recommendation 1.[75] In a sustained discussion, teachers should respond to the students' answers in a way that leads them to think about and elaborate on *their* answers and the meaning of the text.

Teachers should ask students to refer to the text to justify their answers. Depending on the grade level, this may mean recalling events and passages in the text or pointing to illustrations to justify their answers. Follow-up questions should both provide students with a model for thinking about the text and its meaning more actively, and help them learn to construct and support opinions with textual evidence. Examples of recommended follow-up questions include the following: [76]

Table 8. Sample discussion questions related to NAEP categories of comprehension

Locate and Recall	What is the main idea of this section?
	Who were the main characters in *Goldilocks and the Three Bears*?
Integrate and Interpret	How did the bears feel when they found Goldilocks? Why did they feel that way?
	How did Goldilocks feel? Why did she feel that way?
	What are the differences between how Goldilocks and the bears felt?
Critique and Evaluate	What do you think is the most important message in this story?
	How well did the author describe the new ideas in what you just read? If the author asked you what she could have done differently or better to help other students understand, what would you tell her?
	How might Goldilocks behave in the future based on her experience in this story?

Source: Categories of comprehension are drawn from the *Reading Framework for the 2009 National Assessment of Educational Progress*, National Assessment Governing Board (2008), where they are referred to as "cognitive targets." The panel created sample questions for illustrative purposes.

- What makes you say that?

- What happened in the book that makes you think that?

- Can you explain what you meant when you said _____?

- Do you agree with what _____ said? Why or why not?

- How does what you said connect with what _____ already said?

- Let's see if what we read provides us with any information that can resolve _____'s and _____'s disagreement.

- What does the author say about that?

Ideally, initial questions and follow-up questions should resemble a collaborative discussion instead of a typical cycle of teacher initiation (teacher asks a question), student response (one student answers the question), teacher evaluation (teacher evaluates the student's response), followed by the teacher asking an unrelated question directed at the class or a different student. Although common in classrooms, this kind of discourse does not allow students to build meaning from the text in a collaborative way.[77] For younger students, the panel believes that follow-up questions can facilitate discussion, particularly when teachers conduct the discussion in small groups with appropriate supports such as clarifying student answers and guiding students to respond to one another's answers positively.

Students new to in-depth discussion may struggle with this format. Therefore, teachers should model the format and guide them in responding to the text while keeping them focused on both meaning and the discussion question at hand. Younger students may require additional assistance in answering some of these kinds of questions. Throughout the discussion, teachers should remind students to talk to one another and not just to the teacher.

4. Have students lead structured small-group discussions.

As students become more proficient in discussion, the panel suggests providing opportunities for peer-led discussions about text in which students pose questions to their peers.

The key to forming groups is to include students who are relatively good at discussion in each group and to allow students to direct the discussion.

Teachers may select from many structures and techniques for peer-led discussions, including the following:

- Describe and assign a role to each student (e.g., posing questions or keeping the group on task) to ensure that all students participate in the discussion.

- Have students discuss the predictions or summaries of their peers as they use their reading comprehension strategies (see Recommendation 1). The panel cautions that this approach may be difficult for kindergarteners and 1st graders.

- Give students higher-order questions, graphics, or pictures, and ask them to discuss the materials with a partner. The panel recommends this approach for students in kindergarten and 1st grade or as a warm-up for a more challenging discussion for students in 2nd and 3rd grades.

- Ask students to make up questions that get them thinking. For example, give students question stems (see step 2), and have them fill in the blanks and ask the questions of one another.[78] Rotate the responsibility for coming up with a "thinking question." For younger students, provide question stems orally or use word banks or picture clues to remind them how to build questions that make them think.

- After students read a text or a section of a text, guide them to reflect on the text by asking them to draw or write in a journal as preparation for a discussion the next day. Explain to them that the entries should be questions or concerns they want to raise with their peers in discussion.[79] Teachers can support younger students by giving them sticky notes with symbols (e.g., question marks, smiley faces, or exclamation points) to mark sections of the text they want to talk about.

Kindergarten through 3rd-grade students will need extensive modeling and practice to be successful in peer-led discussions. The discussions should start out short and become longer as students get older and have more practice. Introducing the entire activity and its rules (e.g., taking turns, not dominating the discussion, and staying on task) before group work begins will prepare students for it.[80] Teachers can then use simple tools such as the ones listed below to encourage students to participate fully and fairly:

- Give students a chart of rules (with picture clues for younger students) to remind them of appropriate behavior in peer-led discussions.[81]

- Consider setting a rule that no one can talk more than three times until everyone has spoken once.[82] To keep track, consider giving students chips before the discussion begins and having them turn one in each time they talk.

- Require students to prepare ahead of time. Ask them to reflect on specific questions about the text by drawing a picture or writing in a "reading log" before the discussion, or have them talk in small groups before the full class discussion.[83]

- Give students time to formulate their thoughts. When moderating the discussion, wait in silence until many students raise their hands, and call on those who have not yet contributed.[84]

Potential roadblocks and solutions

Roadblock 3.1. *When students are talking with peers, some teachers believe they do not have control of the classroom discussion.*

Suggested Approach. Though discussion involves teachers giving up some control, there are things that can be done to ensure that students stay on task during a discussion. For instance, teachers should provide a clear set of guidelines for discussing the text, including the structure of the discussion and the use of discussion guides, and model higher-order questions and responses to help students stay on point.[87] These supports can serve as "training wheels" while the students strengthen their ability to take part in this kind of a discussion. Teachers can monitor how well students are staying on task from outside the group and can offer assistance as necessary.

Roadblock 3.2. *Students do not understand how to conduct productive discussions about the text with one another.*

Suggested Approach. Teachers should give students opportunities to observe and practice discussion techniques; what is expected of them as discussion leaders should be clearly outlined. Teachers can prepare students to lead a discussion by modeling a leader's behavior and techniques, and then gradually releasing this responsibility to the students. Teachers may consider setting aside a time at the beginning of the year to focus on discussion skills. They may also want to keep peer discussions relatively brief at first, giving students enough time to develop the ability to lead longer discussions. For younger students, who may struggle the most with the group nature of discussions, the panel suggests having them turn and talk to their neighbors.

Roadblock 3.3. *It is difficult to find time to prepare for classroom discussions.*

Suggested Approach. To capitalize on limited time, the panel recommends that teachers collaborate with one another, taking turns preparing discussion questions and guides. Teachers should also establish regular times for discussion early in the school year. In schools where there is only one teacher per grade, teachers can plan collaboratively with teachers at other schools using email or online, and cross-age discussions can be valuable as well. The more practice students have with discussion, the less time teachers will need to spend teaching the activity. Finally, fully developed discussion guidelines can be used repeatedly, saving preparation time.

Roadblock 3.4. *It is difficult to find time to devote to discussion when also teaching decoding skills, comprehension strategies, and vocabulary.*

Suggested Approach. Finding enough time to teach everything there is to teach is a challenge, especially in schools that serve a diverse student population. That said, high-quality discussions should be part of the school day because they have a great deal to do with improving reading comprehension. Devoting time only to word-level skills will not be sufficient to help primary grade students become effective readers. Students developing decoding skills and fluency also need to develop their knowledge of the world and their ability to think about what they read. This can be accomplished in time-efficient ways. For instance, instead of handling discussion as a stand-alone task, teachers can make it part of the process of teaching other comprehension strategies. In addition, teachers can make the most of the time devoted to guiding students through a high-quality discussion by thoroughly preparing for the discussion.

Select texts purposefully to support comprehension development.

There is no such thing as "one-size-fits-all" when it comes to selecting a text for teaching reading comprehension. The panel believes that early exposure to different types of text builds the capacity to understand the large variety of reading material that students will encounter as they move from grade to grade. Not only should teachers introduce students to a variety of texts, but teachers should also ensure that a selected text (1) is rich in depth of ideas and information, (2) has a level of difficulty commensurate with the students' word-reading and comprehension skills, and (3) supports the purpose of the lesson. There are no specific texts that the panel believes are more appropriate than others for strategy training. Specifically for younger students, the panel believes that all texts require students to make inferences or check their understanding, and students' comprehension could always be enhanced by retelling elements of the text.

Summary of evidence: Minimal Evidence

The panel found minimal evidence to support its recommendation that teachers carefully consider the texts they select for teaching reading comprehension. Most of the research either did not compare similar groups of students who were exposed to different qualities of text or was conducted with students older than 3rd graders. Therefore, this recommendation relies on (1) the few studies that attempt to identify the relationship between qualities and characteristics of texts and reading comprehension, (2) the panelists' professional experience in studying and teaching reading comprehension, and (3) other studies that describe how to implement the recommendation. The panel also believes that this recommendation is an essential companion to the other recommendations in the guide that have more evidentiary support.

Although conclusive evidence is not available, studies suggest that the quality of texts, as defined by their difficulty, alignment to assignments and student interests, and clarity, appears to influence reading comprehension. One study found that comprehension was better among 2nd-grade students exposed to text that clearly laid out the elements of the narrative than it was among similar students exposed to poorly structured text.[88] Four additional studies examined the relationship between text type and reading comprehension (without comparing similar groups of students who were exposed to different-quality texts). One study found a positive correlation between the number of engaging and challenging texts to which elementary school students are exposed and their reading comprehension.[89] Another study found that 3rd-grade students appear to understand the distinction between informational and literary texts, and that the structure of students' summaries differed by the type of text they summarized.[90] A third study found that 4th-grade students exposed to more informational text had better reading performance with informational text than with other text types.[91] Finally, the fourth study observed that students choose difficult texts when they are interested in a topic, or when they are already familiar with the text.[92]

How to carry out the recommendation

1. Teach reading comprehension with multiple genres of text.

The NAEP Reading Framework divides texts into the two broad types of literary and informational.[93] **Literary texts** include narratives, which portray a story, or sequence of related fictional or nonfictional events involving individuals or fictional characters, and poetry. **Informational texts** analyze or describe factual information about the natural or social world.[94] The Framework describes which genres fall under each type of text for different grade levels as follows:

- Literary texts include fiction, literary nonfiction, and poetry; in the elementary grades, literary texts can include historical fiction, fables, and autobiographies.

- Informational texts include expository writing, pieces that argue in favor of one position or another, and procedural texts and documents. In the elementary grades, informational texts can include such texts as news articles, speeches, and timelines.[95]

The panel recommends that teachers use both literary and informational texts to teach reading comprehension instruction, because a student's mastery of one does not necessarily transfer to the other.[96] State standards may provide additional guidance on which genres students should be able to comprehend at a given grade level. Digital texts may be literary or informational, and the panel believes that students should learn to read and comprehend them.

2. Choose texts of high quality with richness and depth of ideas and information.

Stories with strong literary merit and informational texts that are accurate, well-written, and engaging are consistently a good choice for teaching reading comprehension. Many resources are available to teachers as they search for high-quality texts, including lists of children's book award winners.[97] Following are some features of high-quality text that place appropriate demands on young readers' interpretive abilities:

- Rich content (e.g., character development in literary text or elaborate detail in informational text)

- Strong organization

- Variation and richness in word choice and sentence structure

3. Choose texts with word recognition and comprehension difficulty appropriate for the students' reading ability and the instructional activity.

Teachers should select text that is neither too simple nor too difficult for students. There are at least two aspects to text difficulty: textual/linguistic demands (e.g., decodability of the words, complexity of the sentences and text organization, clarity of the formatting), and content demands (i.e., how complex, abstract, or subtle the information is). These two aspects of difficulty can vary within the same text,[98] so teachers must be mindful of both. In the panel's experience, a text that is easy to decode may be too difficult for students to comprehend because the information might be complicated or particularly unfamiliar; similarly, a text that deals with concepts that are simple to comprehend may be too demanding with respect to word recognition.

Though the panel does not recommend choosing texts that are too difficult for students to read or understand, students should have opportunities to read somewhat challenging texts. Challenging texts may be most appropriate during activities where there is support available from the teacher, such as in shared reading time or guided reading experiences.[99] Student interest in and background knowledge of the text's subject may also increase their motivation to try to comprehend what they read (see Recommendation 5),[100] so teachers might choose a more challenging text when the topic is of interest or familiar to students.

4. Use texts that support the purpose of instruction.

The many purposes of reading comprehension lessons could include (1) improving students' application of reading comprehension strategies; (2) building their knowledge of specific genres, structures, and texts; or (3) developing their ability to engage in higher-order discussions about the text. Given the large variety of possible goals, the panel believes these points are important for teachers to consider when selecting texts to support the instructional purpose.

When the teacher is

- **Giving a lesson on text structure** → Begin with a text about a familiar topic in which the structure is easy to identify. Move to a text on a less familiar topic and with a somewhat more complex structure.

- **Introducing students to a strategy (such as summarizing)** → Select a text where the strategy is easily applied. Once

students have had time to practice, select a more challenging text.

- **Building a student's depth of understanding** → Avoid texts that only reinforce a student's knowledge of sound-letter relationships. These types of texts are more suitable for practicing decoding and word recognition.

- **Teaching students to make predictions** → Select a text that is unfamiliar to them, or one in which many outcomes are possible.

- **Reading with students (such as with a big book or digitally projected text)** → Select a text that is just above the students' reading level.

- **Reading to students (such as a read-aloud)** → Select a text that is well above the students' reading level but is at their listening comprehension level.

Potential roadblocks and solutions

Roadblock 4.1. *Some school systems have a set curriculum or program in place, and teachers believe that they have little choice in the texts used for teaching comprehension.*

Suggested Approach. In many districts, the use of a core program does not preclude making necessary adjustments or supplementing particular units. For example, teachers could use district science or social studies materials to teach reading comprehension. Teachers could also look to other sources for appropriate books (a school or public library, a local literacy council, or a book drive).[101] Teachers should discuss their concerns about appropriate texts with their administrators.

Roadblock 4.2. *The range of word-reading and comprehension levels in the classroom makes it difficult to select appropriate texts.*

Suggested Approach. It is a good idea for teachers to provide different texts to different students depending on the student and on the teacher's instructional goals. Teachers can also place students in groups according to their interests or the reading lesson. If there is content that all students need to learn, a selection of texts that address the same content at different levels of complexity can be used. Teachers can consult knowledgeable colleagues and, when they are available, literacy coaches and lead teachers who are familiar with children's texts that suit particular demands and address particular topics.

Roadblock 4.3. *There are a lot of texts available to choose from, which makes it hard to know where to start.*

Suggested Approach. Over time, finding the appropriate text may become less of a challenge as teachers build their personal "library" of texts that suit different instructional goals and purposes. Use this resource to teach new students year after year. For suggestions, teachers can consult administrators and other colleagues, including literacy coaches and lead teachers who are familiar with texts for a particular grade level. They can also consult lists of award-winning children's books (see step 2 under "How to carry out the recommendation").

Establish an engaging and motivating context in which to teach reading comprehension.

Students must actively engage with text to extract and construct its meaning,[102] and they will become better readers if they are taught reading comprehension in an engaging, motivating context.[103] A teacher can create this context by clearly conveying the purpose of each lesson, explaining to students how the comprehension strategies will help them learn,[104] and impressing on them that the power to be successful readers rests as much with them as it does with their teacher.[105] In addition, the panel believes that teachers must help students focus not only on completing classroom tasks but also, and more importantly, on the larger goal of learning.[106] Teachers should choose reading materials that offer students a choice in what to read and an opportunity to collaborate with one another.[107]

Summary of evidence: Moderate Evidence

There is moderate evidence that motivating and engaging practices (e.g., cooperative learning) improve students' reading comprehension. Although the evidence for some practices described here is strong, the overall rating is moderate for two reasons. First, engaging practices were tested in combination with other practices, making it difficult to attribute improvements in reading comprehension to the engaging practices. Second, studies examined the impact of engaging practices relative to other resource-intensive reading instructional approaches (e.g., tutors or small groups) and found that engaging practices did not affect reading comprehension differently from these other practices. The panel believes that it would be more relevant to compare engaging practices relative to the effect of typical reading instruction and expects, under this comparison, that engaging practices would have a positive impact on reading comprehension. However, the literature did not explore this contrast.

Among 14 studies that tested the effectiveness of engaging practices, 10 found that the practices improved reading comprehension. The reading programs tested in these 10 studies had varying degrees of alignment to the practices described in this recommendation; indeed, only six tested programs that closely resembled the recommended practices (including three or more such practices).[108] Two other studies focused on programs that were somewhat related to the practices described in this recommendation (i.e., relevant to two or fewer of the recommended practices),[109] and the remaining two studies tested programs that, although effective in increasing reading comprehension, were minimally related to the recommendation.[110] Finally, four of the 14 studies showed negative or no detectable effects of the engaging practices they examined.[111] Appendix D provides more detail on these studies and explains how the panel interpreted the findings.

How to carry out the recommendation

1. Help students discover the purpose and benefits of reading.

Teachers should model how the ability to read affects our daily life, provides enjoyment, and helps students learn about the world.[112] When walking students to the cafeteria, a teacher might stop to read the students a memo posted on a bulletin board that notifies teachers of a meeting. The teacher would then say: "Oh! There is a meeting for teachers after school today. It's a good thing I stopped to read this note so that I can be sure to attend." Teachers could use this scenario to later encourage students to brainstorm about similar situations in which people read about something and how this helps them.

Teachers should give reading a prominent role in the classroom.[113] They can begin by displaying their students' work, posting classroom rules, and reading safety signs and directions together when moving around the school or engaging in classroom routines. Teachers can also fill their classrooms with books that are appealing to students. For instance, the panel recommends creating attractive and prominently located "literacy centers," or classroom libraries, which can be decorated to convey the themes of the books in the center and of interest to the students. The center can have comfortable seating (e.g., beach chairs help create a beach theme), small reading rugs, or pillows to make the reading experience especially enjoyable.[114]

> **Adapting for younger students**
> - If students cannot yet read what is posted around the classroom, pair the text with pictures.
> - Although some students may not yet be able to read an entire book on their own, literacy centers can get students excited about reading by providing a special place in which they can read at their own level and pace.

Teachers can also cultivate student interest in reading through hands-on activities that exemplify a theme. For instance, acting out a scene in a book, drawing, or other crafts can engage students' interest in a subject by making it real to them.[115] To promote students' interest in an informational text about plants, for example, the class might plant seeds in small pots in the classroom so they can watch the plants grow. Then, when reading, the teacher can help the students make meaningful connections between the text and their experience growing plants.

Choose texts in which the themes are relevant to students. "Survival of life on land and in the oceans" would appeal to older students, while books on weather or friendship would resonate with younger students.[116] These themes can be linked to both content standards (e.g., in social studies or science) and student interests.

2. Create opportunities for students to see themselves as successful readers.

Reading comprehension activities should be challenging but attainable with effort, so that students learn to appreciate rather than fear challenge.[118] Teachers should set the bar high but clearly express their expectations that students meet the comprehension challenges in front of them.[119] Instead of punishing students for mistakes or failures, it is better to help them to recognize and learn from such errors; remember, the point is learning. Let students know that mistakes or difficult tasks are opportunities to learn, and encourage them to try despite the challenges.[120]

The panel urges teachers to pay careful attention to the difficulty of reading assignments and to support students as they are learning to read.[121] When students struggle to comprehend a text, teachers can steer them in the right direction by asking questions such as "why" and "how." The idea is to get them to focus on what they are reading or to use their strategies and skills to understand the text.[122] Another way to support students, especially those that can read independently, is to break the text into sections and have the students check in with the teacher or with a peer to go over any points of confusion in the section before moving on.

When students do complete challenging tasks or acquire new skills, provide frequent and specific praise.[123] Working with them to set goals, monitoring their progress toward those goals, and providing frequent positive feedback on their performance can boost students' confidence,[124] which the panel believes increases students' intrinsic motivation to read.

3. Give students reading choices.

Reading choices should be in line with the teacher's instructional purpose.[125] The panel encourages teachers to think creatively about how to give their students a choice in what they read. For example, teachers can

- **Allow students to choose from a variety of reading activities or centers.**[126] Students could go to their classroom literacy center and choose to read to themselves, to a friend or stuffed animal, or to a tape recorder that would later be reviewed by the teacher.[127]

- **Permit students to choose the order in which they complete their work.** When flexibility is possible, teachers can allow students to decide which center to

visit or which text to read first within a set time frame.

- **Encourage students to think of questions that lead them to texts that will hold their interest.**[128] Teachers can support students in finding topics that interest them during reading activities. For example, one student might be interested in the weather, and the teacher may guide him or her toward asking, "Where does

thunder come from?" and then direct the student to a text that could answer his or her question.

- **Allow students to choose how to respond to a text.** Students might present what they learned from their book to the class, work in a group to dramatize a story, keep a journal about the text, or compose an alternative ending to a story for others to read.

- **Give students a choice in where they can read.** Some students might be more comfortable reading at their desks or in a secluded corner of the classroom where they are better able to concentrate. For others, a comfortable chair or carpeted area with pillows might be more inviting.

- **Allow students to choose from a selection of texts that serve an instructional purpose.**[129] For example, to teach about the similarities and differences between animals, teachers might allow students to choose from various texts about animals and ask them to report on what they learned to the group.[130] Students can also take turns selecting a text for the teacher to read aloud to the class from a limited range of options appropriate to the lesson.

4. Give students the opportunity to learn by collaborating with their peers.

Collaborative learning opportunities, whether simple or elaborate, should allow all the students in the group to work together to complete the task.[131] The panel believes that collaborative learning activities are most productive under two conditions: (1) when the students perceive their roles as valuable[132] and (2) when teachers motivate students to help their peers learn rather than simply giving their peers the answer. Examples of collaborative learning opportunities include the following:

- Ask students to read the same text and then talk to a partner about what they read, what they predicted, and any connections they made while reading.

- Pair a student who wants to read a book that is too difficult with a higher-performing reader. Both students can read aloud, alternating paragraphs or pages. As the higher-performing student practices reading fluently, he or she is also modeling fluent reading to the other student.[133] Teachers should guide students in providing constructive support to their peers.[134]

- Pair students to retell a story, identify the main characters or story setting, or make predictions about how the story will end.[135]

> **Adapting for younger students**
> Teachers can provide props such as cutouts or puppets and model how the students will use the puppets to retell the story.

- Pair or group students to learn interesting facts from informational texts. Students can take turns sharing their favorite fact from the same text. Teachers can provide guidance about where students can look for interesting facts.

- Group students to use how-to texts to perform a simple task. Students can take turns following the instructions step-by-step to complete the task as a group. Model strategies for the students to use when reading how-to texts.

- Group students to perform a scripted version of a story they have read, create their own dramatization of a story, or write a new story.[136]

> **Key reminder**
> Encourage students to support and motivate one another as they do challenging reading comprehension activities.

Potential roadblocks and solutions

Roadblock 5.1. *When I put students in learning groups, they get off task.*

Suggested Approach. Teachers should make sure that students understand the activity's purpose and explain it again if they do not. Teachers should also be careful not to give up too much control all at once. For instance, the teacher should sit just outside the group to monitor it closely and intervene if students stray from the task. As the students learn to collaborate, teachers may reduce their monitoring. Finally, teachers can give one student in each group the responsibility for politely reminding everyone to stay on task.

Roadblock 5.2. *Some students still will not engage in classroom reading comprehension activities.*

Suggested Approach. Teachers can consider providing additional motivational supports for students who are not engaged in reading, such as developing special projects involving reading. Teachers should offer positive feedback and should be mindful that aversion to reading may signal frustration, boredom, or possibly a learning disability (and thus the need for a student to be evaluated). Teachers might consider asking a colleague to observe their classroom and brainstorm about how to reach particularly disengaged students.[137]

Roadblock 5.3. *Teachers do not have the resources to offer the range of choices that may appeal to students, or they may believe that content standards do not allow them to offer such choices.*

Suggested Approach. Offer students choices that are appealing but not elaborate or costly. For instance, teachers can allow students to read with a partner to practice fluency, to read aloud to a stuffed animal, or to read quietly to themselves. Teachers who have access to the Internet can make use of resources created by other teachers. If the concern is about content standards, a teacher can follow up a lesson—on a particular strategy or text, for example—by allowing students to read a text they choose on their own, or choose other activities, such as reading to a peer.

Roadblock 5.4. *Students often choose texts that are too easy or too difficult for them.*

Suggested Approach. Teachers can group students by reading level and offer them a selection of books that match that level. Teachers can also create individual "browsing boxes," which contain texts that are expected to be at an appropriate level for each student. Teachers can also teach students explicitly how to select appropriate titles. The "five-finger method" is a good example. A student chooses one text and begins to read it, holding all five fingers up. For each word that gives him trouble, he folds down a finger. If he folds down all five fingers while reading the same page, he must look for an easier book.

Conclusion

The panel believes students should begin learning how to comprehend text effectively from their earliest school years. Toward that end, the panel has put forth five recommendations to guide teacher practice in ways that should improve young students' abilities to understand and remember what they read. These recommendations could be viewed as discrete dishes at a buffet, with teachers sometimes selecting this recommendation or that one as their tastes or situations may dictate. However, a more helpful way to think of these recommendations is as different facets of an indivisible whole, more like the fingers of a glove or the combination of spices in a dish. The panel believes that the integration of these separate recommendations represents the best support for student learning.

Teachers should instruct students about how to use reading comprehension strategies and about how texts are organized in order to guide their thinking during reading, but when students are reading in these ways, they should be doing so with high-quality texts, texts that are worth (in terms of their content and quality) the intellectual effort that such reading requires. Similarly, it is not enough that students practice strategic reading, but they also must come away with new knowledge from what they read, thus ensuring that this strategic reading leads to participation in high-quality meaningful discussions of the content of the texts and that students are motivated to explore the text's meaning deeply.

Glossary

A

Activating prior knowledge refers to students using their existing knowledge to help them construct meaning with a text.

C

Concept Oriented Reading Instruction (CORI) is a branded intervention, developed by John Guthrie and colleagues, which combines instruction in cognitive reading strategies, motivational supports, and science learning in order to increase reading comprehension and intrinsic motivation and engagement around reading.[138] CORI strategies include the development of enabling skills, pre-reading activities to activate background knowledge, questioning, summarizing, studying text structure, and many others.

Cooperative learning is an instructional strategy in which students work collaboratively toward a common goal. Each student in the group has the responsibility to learn and to help others in the group learn. In theory, both low- and high-achieving students benefit from opportunities to learn from their peers, clarify their understanding by explaining or elaborating on a concept, and receive continual feedback in a small-group setting.

D

To **decode**, readers apply knowledge about letter-sound relationships and patterns to identify words in print that they cannot recognize by sight alone.

Readers must **draw inferences** in order to understand what they read because no text is ever fully explicit. Inferences are guesses or hypotheses that a reader makes based on the information that is provided in a text and what the reader knows about the world. For example, if, in a story, young children are going out to play, it may be reasonable for students to infer that the story events are taking place during the daytime, as young children usually do not go out to play alone at night.

E

Enabling skills refer to phonological awareness, phonics, reading fluency, and oral and written vocabulary, a set of corollary skills widely considered to be necessary but not sufficient for successful text comprehension.

Engagement can refer to behavior (ranging from following classroom rules to participating in class and the school community actively),[139] emotions (affectations related to learning including excitement, boredom, or school pride),[140] and cognition (effort and motivation to learn).[141] In reading, engagement refers to the emotional involvement of the reader in reading and responding to text (e.g., a reader who is "lost in a book" is highly engaged). Guthrie and colleagues define reading engagement as "the interplay of motivation, conceptual knowledge, strategies, and social interaction during literacy activities."[142]

G

Gradual release of responsibility is an instructional model whereby a teacher teaches a strategy explicitly and then gradually decreases the level of support to the student, ultimately releasing the student to use the strategy independently.[143]

H

Higher-order questions refer to questions that require the use of cognitive behavior in the categories of application, analysis, synthesis, and evaluation, which require children to build on their factual knowledge and literal comprehension of the text. Bloom originally identified six levels of questioning in his Taxonomy of Educational Objectives (1956), including knowledge and literal comprehension as lower, more basic levels to the higher-order levels mentioned above.

I

Informational text analyzes or explains factual information about the natural or social world.[144] Informational texts include expository writing, pieces that argue in favor of one position or another, as well as procedural texts and documents.[145] Textbooks and other texts used to support science and social studies learning in school, such as biographies and autobiographies, tend to be informational.

M

Monitoring/clarifying/fix up refer to a collection of reading strategies whereby students self-assess their understanding of what they read ("Am I understanding what I'm reading?") and, if their self-monitoring indicates gaps in understanding, they clarify their understanding using various "fix-up" strategies such as rereading, looking something up in a reference guide, asking for help, and/or thinking about what is already known about a topic.

N

Narrative refers to oral or written text that relays a series of events, whether fictional or nonfictional.[146] Novels, short stories, plays, and poems that tell a story are examples of narrative text.

O

Oral reading fluency refers to the ability to read unfamiliar text aloud with sufficient speed and accuracy and with proper expression. Fluent readers read aloud with expression and minimal effort, whereas struggling readers may make frequent mistakes or pause in ways that disrupt the meaning.

P

Phonemic awareness[147] refers to the ability to detect, manipulate, or analyze the individual sounds (phonemes) in spoken words. Phonemic awareness is the most advanced of the phonological awareness skills, and the one most closely related to the development of decoding skills.

Phonological awareness[148] refers to the ability to detect, manipulate, or analyze the auditory parts of spoken language. It includes the ability to segment oral language into words, syllables, or phonemes independent of meaning. Phonemic awareness (see definition above) is a part of phonological awareness.

Predicting is a reading strategy in which students hypothesize or predict what will happen next in a text or what the author will say next in the text.

Q

Questioning is a strategy whereby readers develop questions about important ideas and subjects in the text and attempt to answer them to aid in their own comprehension of the text.

R

Retelling is a process whereby students orally recount a text that they have read. To retell, students must identify and process the critical elements of a text in order to convey them to others.

S

Scaffolding is an instructional technique whereby the teacher provides sufficient guidance and support to allow students to accomplish a goal or execute a strategy successfully (e.g., read a story with understanding, generate predictions) that they cannot do on their own. The teacher reduces the amount of scaffolding as students' skills increase, until the students are able to complete the task successfully and independently.

In **shared reading**, designed to simulate the parent-child at-home reading experience, a group of students interacts with an experienced reader, often a teacher, around a text. The experienced reader reads aloud to students using texts large enough that children can see (e.g., big books, poems on chart paper) so that they can follow along visually and simultaneously hear a fluent reading of the text. In the first reading or subsequent readings, students might be encouraged to participate in the reading of the text by reading along out loud in a chorus, for example.

A **story map** is a visual tool that can be used before, during, or after reading for students and teachers to identify the key elements and structure of a story. Story maps range in complexity from a structured plot summary to detailed descriptions of the characters, setting, problem, events, and main idea. Story maps for younger students are sometimes designed to represent a theme, for example, the trajectory of a space ship or the scoops on an ice cream cone.

Summarizing involves briefly describing, verbally or in writing, the main points of what one has read.

T

Text structure refers to the way in which a text is organized to convey meaning to the reader. It encompasses the organization of ideas in the selection (e.g., sequence of events, comparison, cause and effect) and the vocabulary the author selects to convey meaning to the reader. In text structure instruction, students are taught to identify common text structures and use them to organize the information they are reading.

Think-alouds[149] are oral verbalizations of underlying cognitive processes. Students or teachers read a text, stopping occasionally to explain what they are thinking and how they are approaching the text. Think-alouds can be used effectively by teachers to model particular reading strategies, and students may be asked to think aloud during reading as a kind of formative assessment to guide instruction.

V

Visualizing, another comprehension strategy, involves readers creating a picture or pictures in their minds based on the meaning of the text. Visualizing can include not only imagining sights but also sounds, smells, and other sensory experiences.

Appendix A

Postscript from the Institute of Education Sciences

What is a practice guide?

The Institute of Education Sciences (IES) publishes practice guides to share rigorous evidence and expert guidance on addressing education-related challenges not solved with a single program, policy, or practice. Each practice guide's panel of experts develops recommendations for a coherent approach to a multifaceted problem. Each recommendation is explicitly connected to supporting evidence. Using standards for rigorous research, the supporting evidence is rated to reflect how well the research demonstrates the recommended practices are effective. Strong evidence means positive findings are demonstrated in multiple well-designed, well-executed studies, leaving little or no doubt that the positive effects are caused by the recommended practice. Moderate evidence means well-designed studies show positive impacts, but some questions remain about whether the findings can be generalized or whether the studies definitively show the practice is effective. Minimal evidence means data may suggest a relationship between the recommended practice and positive outcomes, but research has not demonstrated that the practice is the cause of positive outcomes. (See Table 1 for more details on levels of evidence.)

How are practice guides developed?

To produce a practice guide, IES first selects a topic. Topic selection is informed by inquiries and requests to the What Works Clearinghouse Help Desk, formal surveys of practitioners, and a limited literature search of the topic's research base. Next, IES recruits a panel chair who has a national reputation and expertise in the topic. The chair, working with IES, then selects panelists to coauthor the guide. Panelists are selected based on their expertise in the topic area and the belief that they can work together to develop relevant, evidence-based recommendations. IES recommends that the panel include at least one practitioner with relevant experience.

The panel receives a general template for developing a practice guide, as well as examples of published practice guides. Panelists identify the most important research with respect to their recommendations and augment this literature with a search of recent publications to ensure that supporting evidence is current. The search is designed to find all studies assessing the effectiveness of a particular program or practice. These studies are then reviewed against the What Works Clearinghouse (WWC) standards by certified reviewers who rate each effectiveness study. WWC staff assist the panelists in compiling and summarizing the research and in producing the practice guide.

IES practice guides are then subjected to rigorous external peer review. This review is done independently of the IES staff who supported the development of the guide. A critical task of the peer reviewers of a practice guide is to determine whether the evidence cited in support of particular recommendations is up-to-date and that studies of similar or better quality that point in a different direction have not been overlooked. Peer reviewers also evaluate whether the level of evidence category assigned to each recommendation is appropriate. After the review, a practice guide is revised to meet any concerns of the reviewers and to gain the approval of the standards and review staff at IES.

A final note about IES practice guides

In policy and other arenas, expert panels typically try to build a consensus, forging statements that all its members endorse. But practice guides do more than find common ground; they create a list of actionable recommendations. When research clearly shows which practices are effective, the panelists use this evidence to guide their recommendations. However, in some cases research does not provide a clear indication

of what works, and panelists' interpretation of the existing (but incomplete) evidence plays an important role in guiding the recommendations. As a result, it is possible that two teams of recognized experts working independently to produce a practice guide on the same topic would come to very different conclusions. Those who use the guides should recognize that the recommendations represent, in effect, the advice of consultants. However, the advice might be better than what a school or district could obtain on its own. Practice guide authors are nationally recognized experts who collectively endorse the recommendations, justify their choices with supporting evidence, and face rigorous independent peer review of their conclusions. Schools and districts would likely not find such a comprehensive approach when seeking the advice of individual consultants.

Institute of Education Sciences

Appendix B

About the Authors

Panel

Timothy Shanahan, Ph.D., is professor of urban education and director of the Center for Literacy at the University of Illinois at Chicago. His research focuses on the relationship between reading and writing, reading assessment, and improving reading achievement. Dr. Shanahan served as a member of the National Reading Panel from 1997 to 2000 and as president of the International Reading Association from 2006 to 2007. He is on the advisory boards of the National Institute for Literacy, the National Center for Family Literacy, and Reach Out and Read, and he was inducted into the Reading Hall of Fame in 2007. Dr. Shanahan is a former director of reading for the Chicago public schools and a former 1st-grade teacher. He is author or editor of more than 175 publications, including *Teachers Thinking—Teachers Knowing* and *Reading and Writing Together.*

Kim Callison is coordinator of elementary reading/language arts for Anne Arundel County (Maryland) public schools. Her responsibilities include implementing and monitoring a comprehensive reading curriculum and providing professional development for teachers, including reading teachers, and administrators. An educator for 32 years and a National Board Certified Teacher in Literacy, Ms. Callison has focused her career on reading instruction, curriculum development, and school improvement leadership. Her rich variety of teaching experience includes teaching special education students in prekindergarten through 6th grade, serving as an instructor for graduate-level reading courses, presenting at local and state reading conferences, and promoting literacy as a regional reading teacher specialist.

Christine Carriere is the lead literacy teacher for grades K–3 at Carl Von Linne Elementary in the Chicago public school system. She manages the implementation of the school's Reading First grant by coaching teachers in literacy instruction, assessing and analyzing student achievement in reading, and modeling classroom literacy lessons and instructional methods for teachers. Before joining the staff at Carl Von Linne, Ms. Carriere worked for six years in elementary instruction at other public schools in Chicago, as a classroom teacher, school librarian, and summer school reading teacher for at-risk students. She was also the lead literacy teacher at Elizabeth Peabody Elementary. Ms. Carriere also serves as adjunct faculty at several Chicago-area universities, where she teaches undergraduate and graduate students in literacy instruction and student assessment. She has presented at the National Reading Conference and at the American Education Research Organization and is a member of the International Reading Association.

Nell K. Duke, Ed.D., is professor of teacher education and educational psychology (an affiliate of the program in school psychology) and co-director of the Literacy Achievement Research Center (LARC) at Michigan State University. Dr. Duke's work focuses on early literacy development and instruction, particularly among children living in poverty. She has received several awards for her research, including the National Reading Conference Early Career Achievement Award and the American Educational Research Association Early Career Award. She is co-author of numerous books, including *Reading and Writing Informational Text in the Primary Grades: Research-Based Practices* and *Literacy and the Youngest Learner: Best Practices for Educators of Children from Birth to Five.*

P. David Pearson, Ph.D., is dean of the Graduate School of Education at the University of California–Berkeley. Dr. Pearson's research focuses on practice and policy in literacy instruction and assessment. As dean of the College of Education at the University of Illinois at Urbana-Champaign, he co-directed the Center for the Study of Reading. He is a member of the National Academy of Education and has served as president of the National Reading Conference and on the board of directors

for the International Reading Association, the National Reading Conference, and the Association of American Colleges of Teacher Education. Dr. Pearson has received awards from the International Reading Association, the National Reading Conference, and the National Council of Teachers of English. He has published extensively on reading education, including the *Handbook of Reading Research*, now in its fourth printing, and *Learning to Read: Lessons for Effective Schools and Accomplished Teachers.*

Christopher Schatschneider, Ph.D., is professor of cognitive psychology at Florida State University and associate director of the Florida Center for Reading Research. Dr. Schatschneider's research includes identifying the skills contributing to reading ability and the use of these skills to identify children at risk for early reading problems. He serves on the National Early Literacy Panel and was the founding member of the Texas Institute for Measurement, Evaluation, and Statistics. Dr. Schatschneider has studied the impact of several components of reading instruction as the co-principal investigator for the *Phase 1*

Early Reading Intervention Study: Getting Ready for Scale-up. Dr. Schatschneider's published articles include "Effects of Intensive Reading Remediation for Second and Third Graders and a One Year Follow-Up," "Kindergarten Prediction of Reading Skills: A Longitudinal Comparative Analysis," and "Growth in Early Reading Skills from Kindergarten to Third Grade."

Joseph Torgesen, Ph.D., is a professor emeritus of psychology and education at Florida State University and director emeritus of the Florida Center for Reading Research. His research focuses on the psychology of reading and reading development, prevention and remediation of reading difficulties, and assessment. He is the author of approximately 190 articles, book chapters, books, and tests related to reading and learning disabilities. Dr. Torgesen is a past member of the board of directors of the Institute of Education Sciences. He received the Samuel T. Orton Award from the International Dyslexia Association for his contributions to the science of reading and dyslexia, and for his work supporting improved instructional practices in schools.

Staff

Virginia Knechtel is a research analyst at Mathematica Policy Research and a former special education teacher. She has researched principal-development pipelines in a large school district and developed two new programs to recruit and develop exceptionally well-qualified principal candidates in that district. Ms. Knechtel worked with quantitative data in the evaluation of a teacher incentive program funded by the U.S. Department of Education. She has also worked to recruit districts and schools for a U.S. Department of Education study of selected alternative routes to teacher certification.

Emily Sama Martin, a human services researcher at Mathematica Policy Research, has served as both reviewer and coordinator

for What Works Clearinghouse topic areas and practice guides, including the Beginning Reading topic area. She supported the panel in analyzing the evidence for effective reading comprehension practices that were reviewed for this practice guide. Ms. Sama Martin has played a leading role on a range of program evaluations and research projects in early childhood development, education, welfare, and nutrition.

Samina Sattar is a research analyst at Mathematica Policy Research. She has served as a practice coordinator on WWC practice guides, as well as providing support for multisite evaluations of math curricula, intensive teacher induction programs, and teacher pay-for-performance incentives. As part of a project to provide analytic and technical assistance to the Institute of Education Sciences,

U.S. Department of Education, Ms. Sattar contributed to white papers on evaluation methods with the goal of improving the quality of education research. She has also been involved in studies of labor, family support, and early childhood programs and policies.

Sarah Wissel, a program associate at Mathematica Policy Research, plays numerous roles in the development of WWC practice guides, topic areas, and other practitioner-friendly products, including acting as the lead coordinator across all topic areas. She assisted panels in developing several recent practice guides, including *Helping Students Navigate the Path to College: What High Schools Can Do* and *Using Student Achievement Data to Support Instructional Decision Making.* She also serves as a coordinator for the Adolescent Literacy topic area.

Disclosure of Potential Conflicts of Interest

Practice guide panels are composed of individuals who are nationally recognized experts on the topics about which they are making recommendations. IES expects the experts to be involved professionally in a variety of matters that relate to their work as a panel. Panel members are asked to disclose these professional activities and institute deliberative processes that encourage critical examination of their views as they relate to the content of the practice guide. The potential influence of the panel members' professional activities is further muted by the requirement that they ground their recommendations in evidence that is documented in the practice guide. In addition, before all practice guides are published, they undergo an independent external peer review focusing on whether the evidence related to the recommendations in the guide has been presented appropriately.

The professional activities reported by each panel member that appear to be most closely associated with the panel recommendations are noted below.

Timothy Shanahan receives royalties as an author of *Macmillan/McGraw-Hill Treasures*, a reading program for students in kindergarten through 6th grade. This program is not mentioned in the guide.

Nell K. Duke is paid for her work as an author of *National Geographic Science*, a program that includes reading comprehension instruction. Dr. Duke does not receive royalties from the sale of these or other curriculum materials. *National Geographic Science* is not mentioned in the guide.

P. David Pearson receives royalties as an author of *Scott Foresman Reading Street*, a reading program for students in pre-kindergarten through 6th grade. This program is not mentioned in the guide. He is also paid for his work as an author of *National Geographic Science*, a program that includes reading comprehension instruction. Dr. Pearson does not receive royalties from the sale of these or other curriculum materials. *National Geographic Science* is not mentioned in the guide.

Joseph Torgesen receives royalties from two reading programs for elementary students: *Early Interventions in Reading*, distributed by SRA/McGraw-Hill, and *Phonological Awareness Training for Reading*, distributed by PRO-ED. Dr. Torgesen also receives royalties from materials published by Sopris West for use with the Peer-Assisted Learning Strategies program, and from PRO-ED for the following early reading assessments: Comprehensive Test of Phonological Processes, Test of Word Reading Efficiency, Test of Phonological Awareness 2+, and Test of Preschool Early Literacy. The Peer-Assisted Learning Strategies program was tested in one of the studies cited in Recommendation 5. None of the other programs or materials were considered for or included in the guide.

Rationale for Evidence Ratings

In this appendix, we provide details on the design and findings of studies that the panel used as its evidence base for the five recommendations in this guide and discuss the evidence for each recommendation. Specifically, the appendix focuses on studies that employ causal designs to test the effectiveness of recommended practices: randomized controlled trials (RCT) and quasi-experimental designs (QED) that meet WWC standards (with and without reservations). The discussion of studies that analyzed the correlation between practices and comprehension outcomes in the absence of a causal design paints a broad picture of the literature, but the panel recognizes that correlational studies do not meet WWC evidence standards.[150]

In its examination of the causal evidence for practices in this guide, the panel focused on identified studies that showed positive comprehension effects that were statistically significant ($p < 0.05$) or substantively important (effect sizes larger than 0.25, but not statistically significant). The WWC adjusts for clustering of students in classrooms (or classrooms within schools) if the original study did not, in order to make proper statistical inferences from the study.

Some studies met WWC standards (with or without reservations) for causal designs but did not provide the standard deviations needed to confirm or calculate effect sizes. In these cases, we indicate that we were unable to confirm the magnitude or statistical significance of some findings. In some other cases, the panel identified studies showing no detectable (small and not statistically significant) reading comprehension effects of its recommended practices. In these cases, the panel discusses how the study fits with the rest of the evidence on the specific recommendation. The final type of evidence discussed by the panel is studies with causal designs that may meet WWC evidence standards (with or without reservations) but that lack details, such as sample attrition or how students were assigned to treatment and control groups. Similar to correlational evidence, these studies are used to corroborate the information available from causal studies but are insufficient on their own to generate a moderate evidence or strong evidence rating.

Recommendation 1
Teach students how to use reading comprehension strategies

Level of evidence: Strong Evidence

Recommendation 1 advocates the provision of classroom instruction in effective reading comprehension strategies, individually or in combination, and then the gradual release of responsibility for using those strategies from the teacher to students. The evidence to support instruction in text comprehension strategies is strong. Thirteen studies tested the effects on reading comprehension of instructional practices that include strategies instruction as a major or minor component; eleven of these met WWC standards (with or without reservations), while two potentially met standards and were used to corroborate the evidence base for the recommendation.[151] Twelve of the studies, including five in which teachers gradually released responsibility for strategy use to students, found positive reading comprehension effects for students exposed to the recommended strategies relative to students who were not taught to use the strategies (Table D.1).[152] In the 13th study, Bramlett (1994) tested the impact of Cooperative Integrated Reading and Composition (CIRC) on 3rd-grade students' reading comprehension. Retelling, a strategy recommended by the panel, is one of many components of CIRC's instructional approach that is compared to traditional classroom instruction in this quasi-experimental study. Although the study found no detectable effect of CIRC on comprehension, the panel still rates the evidence for comprehension strategies instruction as strong evidence because

such instruction is only a minor component of CIRC. The panel consulted the study for examples of the implementation of retelling activities in primary grade classrooms.

Four other studies met WWC evidence standards (with and without reservations) and included reading comprehension strategies but exposed students in both study conditions to the same comprehension strategies.[153] Given that these studies do not test for effectiveness against a no-strategy or different-strategy condition, the panel looked to them as resources for describing strategy instruction implementation rather than as evidence of the strategies' effectiveness.

This section discusses evidence for each strategy, the evidence for instruction in several strategies, and finally, the evidence for using gradual release of responsibility when teaching comprehension strategies.

Activate Prior Knowledge/Predict. Six studies with causal designs that met WWC standards incorporated instruction in predicting or activating prior knowledge into study conditions that had positive effects on reading comprehension for students in kindergarten through 3rd grade. In one study, Hansen (1981) randomly assigned students to instruction in activating prior knowledge, instruction in inference, or a control condition that did not include strategy instruction. The study found substantively important positive effects for the prior knowledge condition versus the control condition for 7 of 10 reading comprehension outcomes.[154]

Two other studies focused on directed reading activities, in which teachers both deliver instruction aimed at activating students' prior knowledge and undertake other pre- and post-reading activities. The studies reported that students in the directed reading activities condition had significantly better text comprehension and recall than did students in the comparison condition.[155] However, neither study reported standard deviations for the outcome scores; thus, the WWC was unable to

confirm statistical significance. Even though the two studies suggest that activating prior knowledge can potentially improve comprehension, they neither tested nor provided evidence for the effectiveness of instruction in activating prior knowledge in isolation from other practices. However, in support of this strategy, results from Hansen (1981) indicate that instruction in activating prior knowledge independently improves comprehension.

Three other studies tested the effects of teaching conditions that incorporated multiple comprehension strategies, including prediction or activation of prior knowledge. One study found large and statistically significant effects of Transactional Strategies Instruction (TSI) on reading comprehension.[156] The second study involved three comprehension outcomes, although the effect of the experimental condition (Informed Strategies for Learning [ISL]) was not statistically significant for any of the outcomes and was large and positive for only one of three outcomes.[157] The panel cautions that the study results do not provide strong evidence that training students to predict or activate prior knowledge as an isolated strategy is effective in raising comprehension, but it does indicate that such training is effective in combination with other strategy instruction. The third study tested the effectiveness of reciprocal teaching, which incorporates predicting, versus instruction with a basal reader in a quasi-experiment. The study found substantively important (but not statistically significant) reading comprehension effects.[158]

Question. No studies meeting WWC standards tested questioning as an isolated comprehension strategy among students in kindergarten through 3rd grade, but four studies reported positive comprehension effects for bundles of strategies that included questioning. Three of the studies examined multiple-strategy instruction packages (TSI, directed reading activity, and reciprocal teaching) and reported large and significant effects.[159] The fourth study found significantly better comprehension outcomes for 6- to 9-year-old students in

an inference training and question word use group (e.g., *where, when*) relative to those using a standard comprehension exercise.[160] However, the study did not report posttest means and standard deviations, so the WWC cannot verify the authors' conclusion. Even though the four studies tested questioning in combination with other reading comprehension strategies, the panel believes that, together, they support instruction in question generation as an effective reading comprehension strategy.

Visualize. Two studies incorporating visualization instruction used experimental study designs and met WWC evidence standards. The first focused explicitly on visualization, randomly assigning students to conditions in which they did or did not receive visual imagery training (students in both groups were trained in questioning and activating prior knowledge).[161] The study found large and statistically significant positive reading comprehension effects for students in the visualization condition, strongly supporting the effectiveness of such training. Although the students in the study were at the older end of the age range for this practice guide (average age was 7.6 years), the panel believes that visualization training may be effectively implemented with younger students. The second study focused on 2nd-grade students and incorporated visualization training as a component of TSI.[162] Although the study did not provide further evidence that visualization training is effective on its own, the positive and statistically significant comprehension difference between students in the TSI condition and their peers who did not receive visualization training suggests that visualizing is a useful component of multiple-strategy instruction.

Monitor/Clarify/Fix Up. No studies that met WWC standards specifically tested the effectiveness of teaching students to monitor, clarify, or fix up as they read; therefore, the panel relied on three studies of multiple-strategy instruction in which experimental students received instruction in the monitor/clarify/fix-up strategy. Brown et al. (1995) found large and statistically

significant effects of TSI versus a control condition in which students did not receive strategy instruction. Williamson (1989) found a substantively important comprehension effect for reciprocal teaching versus a control instruction that did not include comprehension strategies. Paris, Cross, and Lipson (1984) found that only one of three comprehension effects was large and that none were statistically significant. As described in the sections on activating prior knowledge and drawing inferences, the panel still rates the evidence supporting Recommendation 1 as strong evidence because instruction in the experimental condition (ISL) combined many instructional practices. Indeed, in considering the first two studies, the panel concludes that teaching students to monitor, clarify, and fix up as they read can improve reading comprehension. Although the two studies focused on students in 2nd and 3rd grade, the panel believes that teachers should provide instruction in these strategies to students in kindergarten and 1st grade.

Draw Inferences. To support its recommendation that teachers provide instruction in drawing inferences, the panel relied on one study that explicitly tested the comprehension effects of inference training and on two studies that tested the effectiveness of multiple-strategy instruction that included inference. As described in the section on activating prior knowledge, Hansen (1981) included one experimental condition in which students received explicit instruction about drawing inferences to improve their reading comprehension. Students in this condition achieved larger comprehension gains than both students in a no-strategy control condition and students taught to activate prior knowledge as a key strategy for improving reading comprehension.[163]

The first of the two multiple-strategy instruction studies found no significant effects (and only one substantively important effect) on comprehension for students in the experimental condition. However, the panel cautions that the study's experimental condition included several other strategies as well as a focus on

metacognition,[164] so its small and nonsignificant effects should not be interpreted to mean that inference training is not effective in increasing comprehension. The other study focused on inference training but included instruction in other strategies (such as questioning) in the experimental condition. The authors reported larger comprehension growth for experimental students versus no-strategy control students.[165] However, the WWC was unable to calculate the size and confirm the significance of the effect because the study did not provide standard deviations. The panel believes that, interpreted together, the studies indicate that inference training can improve students' reading comprehension.

Summarize/Retell. The panel identified five studies that tested the comprehension effects of retelling on students in kindergarten through 3rd grade. Retelling was a critical component of the first study, an RCT in which small groups of kindergarten students listened to a story and then individually either retold the story to an adult or illustrated it.[166] The author reported that retelling had a small but statistically significant effect on overall reading comprehension but produced no statistically significant comprehension differences between groups on two comprehension subtests. The WWC could not confirm the author's findings without standard deviations for the outcomes.

The four other studies, two RCTs and two QEDs, incorporated summarizing/retelling into tested instructional conditions, but the strategy was a minor component. In three of the four, students in the study conditions that included retelling or summarizing texts achieved better comprehension scores than did students in comparison conditions.[167] In the fourth study, Morrow, Rand, and Young (1997) primarily investigated the effect of cooperative literacy experiences, although teachers in the treatment condition also encouraged students to retell stories. Missing information on the final sample size prevented the WWC from both determining whether the study met its standards and calculating final effect sizes,

although the authors report that the experimental students achieved significantly better scores on recalling, retelling, and rewriting stories than did comparison students. The panel recognizes that the positive comprehension effects in these studies cannot necessarily be attributed to summarizing/retelling. However, the studies all reported positive rather than negative or insignificant effects of the conditions that included retelling and summarization. The panel concludes that, together, the four studies indicate that teaching students to summarize or retell as they read likely improves comprehension.

Teach Strategies Individually or in Combination. Two of the studies constituting the panel's evidence base for Recommendation 1 found that reading comprehension improves when students are taught to select among and use several comprehension strategies as they struggle to comprehend text.[168] Two other studies reported positive comprehension effects (although the WWC could not confirm the findings) in study conditions in which students learned multiple strategies even though they may not have received specific instruction in selecting from their repertoire of strategies when encountering difficult text.[169] Although other studies documented the comprehension effects of teaching individual strategies,[170] the panel believes that students must learn to orchestrate multiple strategies while they read. The panel further believes that students require specific reminders to choose among and apply these strategies purposefully to overcome comprehension challenges. In fact, Reutzel, Smith, and Fawson (2005) compared the comprehension performance of students in 2nd-grade classrooms randomly assigned to a multiple-strategy instruction condition (TSI) to that of students receiving instruction in a bundle of strategies. Students in the TSI condition learned two additional strategies: text structure (Recommendation 2) and goal setting. The panel believes that the critical dimension of this study is that the teachers in the TSI classrooms taught the strategies in an integrated fashion and explained to students how

to coordinate the strategies when interacting with a range of texts, whereas single-strategy instruction (SSI) teachers taught individual strategies without describing how students could connect or select among them.[171] Three of four comprehension outcomes showed large impacts of the TSI condition, one of which was statistically significant. Despite the absence of strong evidence favoring multiple-strategy instruction over teaching students to use individual strategies, the panel believes that it is critical to equip students with several strategies for addressing their particular comprehension needs as they read.

Gradually Release Responsibility for Strategies to Students. Although the panel believes that gradually releasing responsibility for using comprehension strategies to students is a critical part of strategies instruction, no studies specifically compared the effects of strategies instruction with and without the shift in responsibility. Seven studies found positive effects of comprehension-strategies

instruction that implemented elements of the gradual release of responsibility as part of that instruction.[172] For example, teachers in the two study conditions examined by Reutzel, Smith, and Fawson (2005) gradually released responsibility to students for applying the strategies they learned, shifting over the course of a semester from teachers' explanation and modeling to students' selection, explanation, and use of strategies. In addition, Williamson (1989) found substantively important effects of reciprocal teaching that involved the gradual release of responsibility as compared to instruction with a basal reader. Among the six studies, only two explicitly claimed to involve the gradual release of responsibility,[173] but all six included elements of the approach in their description of how students received instruction. Therefore, although the research does not clearly establish the effectiveness of gradual release of responsibility, it does support part or all of the approach when providing instruction in comprehension strategies.

Table D.1. Studies testing effectiveness of reading comprehension strategy instruction

Study Details					Comprehension Strategies Tested							Gradual Release of Responsibility Elements
Brief Citation	Study Design	Study Size and Population[a]	Comprehension Outcome and Effect Size[b]	Named Intervention	Alignment to Recommendation[c]	Activate Prior Knowledge/Predict	Question	Visualize	Monitor/Clarify/Fix Up	Draw Inferences	Summarize/Retell	
Studies Meeting WWC Standards With or Without Reservations												
Studies Showing Positive Comprehension Effects												
Brown et al. (1995)	QED	10 classrooms; 1st and 2nd grades, United States	SAT-9 Reading Comprehension: +1.65, sig	Transactional Strategies Instruction	✓✓✓	X	X	X	X		X	Explicit description, modeling
Center et al. (1999)	RCT	66 students; average age 7.6 years, Australia, urban	Neale Listening Comprehension: +0.52, sig	None	✓✓			X				Explicit description, modeling, guided practice, independent use
Hansen (1981)	RCT	24 students; 2nd grade, Midwest	Infer versus control: 10 outcomes, 7 are > 0.25, ns. Prior knowledge versus control: 10 outcomes, 6 are > 0.25, ns, 1 is < −0.25, ns. Infer versus prior knowledge: 10 outcomes, 8 are > 0.25, ns, 1 is < −0.25, ns	None	✓✓	X				X		None
Morrow, Pressley, and Smith (1995)[d]	RCT	6 classrooms; 3rd grade, United States	California Test of Basic Skills: E2 versus C: +0.11, ns. Researcher-designed test: E1 versus C: +1.63, sig E2 versus C: +0.79, ns	None	✓						X	None
Paris, Cross, and Lipson (1984)	RCT	4 classrooms; 3rd grade, United States	Three outcomes, none significant, one (Error Detection) > 0.25, ns	Informed Strategies for Learning	✓	X			X	X		Explicit description, modeling
Reutzel, Smith, and Fawson (2005)[e]	RCT	4 classrooms; 2nd grade, high-poverty, low-performing elementary school, United States	+0.20 to +0.61, some sig	Transactional Strategies Instruction versus single strategies	✓✓✓							Explicit description, modeling, guided practice, independent use

(continued)

Table D.1. Studies testing effectiveness of reading comprehension strategy instruction *(continued)*

Study Details					Comprehension Strategies Tested							Gradual Release of Responsibility Elements
Brief Citation	Study Design	Study Size and Population[a]	Comprehension Outcome and Effect Size[b]	Named Intervention	Alignment to Recommendation[c]	Activate Prior Knowledge/ Predict	Question	Visualize	Monitor/ Clarify/ Fix Up	Draw Inferences	Summarize/ Retell	
Williamson (1989)	QED	83 students; 3rd grade, South	Illinois State Assessment, Constructing Meaning subtest: +0.36, ns	Reciprocal Teaching[f]	✓✓✓	X	X		X		X	Modeling, guided practice, independent use
Studies Showing Positive Comprehension Effects Not Confirmable by the WWC												
McGee and Johnson (2003)	RCT	40 students; students age 6 to 9 years, United Kingdom	Report significant positive growth in comprehension age[g]	None	✓✓✓		X			X		Explicit description, modeling, guided practice, independent use
Morrow (1984)	RCT	254 students; kindergarten, United States, urban and suburban	Report significant positive effect on researcher-designed measure[g]	Directed reading activity	✓	X	X					None
Morrow (1985)	RCT	59 students; kindergarten	Report significant positive effect on overall comprehension measure[g]	None	✓						X	None
Study Showing No Detectable Comprehension Effects												
Bramlett (1994)	QED	18 classrooms; 3rd grade, Midwest, rural	California Achievement Test, Comprehension: +0.10, ns California Achievement Test, Word Analysis: +0.11, ns	CIRC	✓	X					X	None
Studies Potentially Meeting Standards												
Beck, Omanson, and McKeown (1982)	RCT	47 students; 3rd grade, Mid-Atlantic, urban	Report positive comprehension effects[g]	Directed reading activity	✓	X						None
Morrow, Rand, and Young (1997)	RCT	12 classrooms; 1st through 3rd grade, United States, urban	Report significant positive effects on probed comprehension, story retelling, and rewriting[g]	None	✓						X	Modeling

(continued)

Table D.1. Studies testing effectiveness of reading comprehension strategy instruction
(continued)

a. Studies with three check marks (close alignment) contained elements of most practices suggested in Recommendation 1 and explicitly tested the impacts of these practices on reading comprehension. Studies with two check marks (fair alignment) tested the comprehension effects of only one of these practices, either in isolation or in conditions that included other recommended practices in two or more study conditions. Studies with one check mark (minimal alignment) tested the comprehension effects of only one recommended practice.

b. ns: not significant; sig: statistically significant (p < 0.05). When effect size or significance could not be calculated or confirmed, the table describes the effects reported by the author(s).

c. Studies with three check marks tested the comprehension effects of multiple strategies taught to students using gradual release of responsibility and did not bundle this instruction with other key instructional practices unrelated to strategies. Studies with two check marks explicitly tested the impacts of multiple comprehension strategies on reading comprehension and did not bundle such instruction with other key instructional practices. Studies with one check mark tested the comprehension effects of only individual comprehension strategies or the effectiveness of strategies in conditions that bundled them with other classroom practices unrelated to strategies.

d. **Morrow, Pressley, and Smith (1995)** had two experimental conditions: literature-based reading in literacy instruction (E1) and literature-based reading in literacy and science instruction (E2). Both programs were compared to a control condition using a basal reader (C).

e. **Reutzel, Smith, and Fawson (2005)** tested the effects of multiple-strategy instruction versus single-strategy instruction and examined the effects of study conditions that included activating prior knowledge and predicting, visualizing, monitoring, and questioning. The Transactional Strategies Instruction condition also included instruction in other strategies and in how students could select among and apply a number of strategies.

f. **Williamson (1989)** did not specify the strategies in the study's reciprocal teaching condition, but the panel was able to complete the table by drawing on its background knowledge about comprehension strategies that are considered part of the reciprocal teaching package.

g. The study was missing information that the WWC needed to confirm the authors' reports of effects' magnitude or statistical significance.

**Recommendation 2
Teach students to identify and
use the text's organizational
structure to comprehend, learn,
and remember content**

Level of evidence: Moderate Evidence

Among the studies identified by the panel as
related to Recommendation 2, six studies that
met WWC standards with or without reserva-
tions tested the effect on reading comprehen-
sion of practices that included text structure
instruction, and these six constitute the evi-
dentiary support for the recommendation.[174]
More specifically, four examined impacts
using narrative text structure, and two
focused on informational text structure (Table
D.2). The level of evidence for Recommenda-
tion 2 is rated as moderate evidence because
only these six studies tested the respective
steps for carrying out the recommendation
and often included practices other than text
structure instruction in the experimental
condition. Two additional studies tested the
effectiveness of teaching students about text
structure but focused on *listening* compre-
hension outcomes for 2nd- and 3rd-grade
students and therefore were not considered
further as evidence for this recommendation,
although they provided useful examples of
how to teach text structure.[175]

Four studies tested components of Recom-
mendation 2 while using narrative text. Three
of these found that text structure instruction
improves reading comprehension among stu-
dents in kindergarten through 3rd grade. The
fourth study found no difference between stu-
dents in two study conditions.[176] In this quasi-
experimental study, students in the treatment
condition participated in CIRC (which includes
story structure instruction) while comparison
group students received regular classroom
instruction. Despite no detectable effect of
CIRC on comprehension, the panel rates the
evidence supporting Recommendation 2 as
moderate evidence because text structure
instruction is only a minor element of the full
CIRC program.

The remaining three studies that used narra-
tive text found positive effects and provided
the panel with convincing causal evidence to
support Recommendation 2. In the first study,
Baumann and Bergeron (1993) compared the
reading comprehension performance of stu-
dents randomly assigned to four conditions:
story mapping, story mapping with a writing
component, directed reading and thinking
activity in which students use predict-and-
verify strategies, and a control group with no
specific reading comprehension instruction.
Comparing the two story-mapping condi-
tions to the other two conditions, the authors
found substantively important positive com-
prehension effects (including a persistence of
the effect two weeks after completion of the
intervention). The second study compared
the performance of 2nd-grade students
from classrooms assigned to three condi-
tions: literature-based reading and writing,
that same program plus a reading-at-home
component, and a control condition; teachers
in the experimental conditions emphasized
story elements during instruction, along with
other practices.[177] The study found positive
comprehension impacts for the students who
received daily story element instruction on
reading comprehension versus those who
received basal reading instruction. Finally,
the third study reported that students whose
teachers discussed and asked questions about
the narrative text structure before and after
students read the text scored better on com-
prehension questions than did students who
did not receive text structure instruction.[178]

In addition to the four studies examining
narrative text described above, two stud-
ies focused on informational text. The
first compared TSI to SSI; the TSI condition
included two strategies not taught in the
comparison condition (one of which was text
structure instruction) and encouraged stu-
dents to consider a range of comprehension
strategies while reading.[179] TSI outcomes had
substantively important positive effects on
comprehension for three of four outcomes
(one of which was statistically significant).
The study did not illuminate whether the

integrated style of teaching strategies in TSI, the two additional strategies, or some combination explains the comprehension effects, but the panel attributes the effect primarily to the integrated nature of TSI instruction rather than to text structure instruction.

The second study compared students receiving text structure instruction to students receiving subject matter instruction as well as to students receiving neither (the panel concentrated on the comparison between the structure instruction and no-treatment groups).[180] Activities in the text structure instruction condition focused on cause-and-effect structure in a social studies text. The study reported substantively important positive effects for 7 of 12 researcher-designed comprehension outcomes that assessed causal, non-causal, and effect questions in

Table D.2. Studies testing effect of text structure instruction on reading comprehension

Study Details					
Brief Citation	**Study Design**	**Study Size and Population**	**Comprehension Outcome and Effect Size**[a]	**Alignment to Recommendation**[b]	**Text Type**
Positive Comprehension Effect					
Baumann and Bergeron (1993)[c]	RCT	74 students; 1st grade, Midwest, rural	Author-designed outcomes: Central story elements: +1.40, ns Story map components: +0.78, ns Central story components: +0.82, ns Delayed posttest: +0.75, ns	✓✓	Narrative
Morrow (1984)[d]	RCT	254 students; kindergarten, United States	Author reports improved performance on structural comprehension questions	✓✓	Narrative
Morrow (1996)	RCT	6 classrooms; 2nd grade, United States, urban	Probed recall comprehension test: +1.81, sig	✓	Narrative
Reutzel, Smith, and Fawson (2005)	RCT	4 classrooms; 2nd grade, high-poverty, low-performing elementary school	Gates MacGinitie: +0.20, ns End-of-level test: +0.61, sig Unfamiliar retell superordinate idea units: +0.47, ns Unfamiliar retell subordinate idea units: +0.47, ns	✓	Informational
Williams et al. (2007)[e]	RCT	10 classrooms; 2nd grade, United States	12 author-designed outcomes; 7 effects > +0.25, 3 sig 1 effect < −0.25, ns	✓✓	Informational
No Detectable Comprehension Effect					
Bramlett (1994)[f]	QED	392 students; 3rd grade, Midwest, rural	California Achievement Test, Comprehension: +0.10, ns California Achievement Test, Word Analysis: +0.11, ns	✓	Narrative

a. ns: not significant; sig: statistically significant (p < 0.05).
b. Studies with two check marks tested the comprehension effects practices included in Recommendation 2 in isolation. Studies with one check mark tested the comprehension effects of some practices included in Recommendation 2 but did so in experimental conditions that also included practices that are not part of this recommendation.
c. **Baumann and Bergeron (1993)** included four conditions: story mapping, story mapping with a writing component, directed reading and thinking activity (DRTA), and directed reading activity (DRA). To calculate effects, the WWC pooled the two story-mapping conditions and compared them to the other two conditions pooled together. Although the authors reported the four effects to be statistically significant, the WWC did not find the effects significant after adjusting for multiple comparisons within the comprehension domain.
d. **Morrow (1984)** did not provide standard deviations for the outcome measures; therefore, the WWC could not confirm the size or significance of the positive comprehension impacts reported by the author.
e. **Williams et al. (2007)** studied 15 classrooms, but the panel focused on the comparison between five text structure instruction classrooms and five no-treatment comparison classrooms for this guide. For this comparison, the sole negative effect was observed on the author-designed measure of comprehension that used a non-causal question.
f. **Bramlett (1994)** reported that the effects were statistically significant. However, after adjusting for clustering of students into classrooms, the WWC did not find the effect to be statistically significant.

near transfer, far transfer, and authentic text. Three of those substantively important positive effects were statistically significant. Four of the measures showed effects that were neither statistically significant nor substantively important. Finally, one of the 12 outcomes (non-causal questions in authentic text) was large and negative (effect size = −0.40). This was the sole negative finding among the studies that tested the effectiveness of the recommendation.

Recommendation 3
Guide students through focused, high-quality discussion on the meaning of text

Level of evidence: Minimal Evidence

The panel believes that engaging students in high-quality discussion about the meaning of text can improve reading comprehension, but most studies of the comprehension effects of discussion about text or the use of higher-order questions either do not use causal research designs or focus on older students. Accordingly, the level of evidence to support Recommendation 3 is minimal evidence. The panel identified one study meeting WWC standards. In that study, 2nd-grade students exposed to TSI engaged in peer-led discussions of text as they used comprehension strategies, but the study also involved a significant amount of instruction in comprehension strategies (see Recommendation 1 in this appendix).[181] Even though the study found significant improvements in comprehension, TSI incorporates so many elements besides peer discussion that the panel did not see strong evidence or moderate evidence in support of peer discussion.

Two other studies used causal research designs but lacked the details needed to confirm the strength of evidence. One, which met WWC standards, reported that students in three separate discussion groups that underwent progressively complex levels of questioning achieved better comprehension outcomes than did comparison students who did not discuss the text. However, the study did not report the standard deviations required to confirm the statistically significant findings asserted by the author.[182] Similarly, Beck, Omanson, and McKeown (1982) examined the use of in-depth questions during one-to-one instruction (rather than in the context of classroom discussion) and reported that students exposed to such questions scored higher on comprehension measures than did students not exposed to the questions. The study was missing necessary information (on baseline equivalence of the two groups and on standard deviations), preventing the WWC from assessing whether the study met standards and from confirming the study-reported effects. Even though the studies did not demonstrate that discussion leads to improved reading comprehension, they provided the panel with information for developing advice about using higher-order questions and with some insight into how discussing the questions during reading instruction may be related to reading comprehension.

Four additional studies used correlational designs to examine the effect of higher-order questions on reading comprehension. Given that the studies did not include a comparison group, the panel recognizes that they do not provide rigorous evidence that such questions effectively increase comprehension. Two of these studies reported that the "most effective" teachers and schools were more likely to pose higher-order questions to students (in both discussions and writing assignments) than they were to pose lower-order questions or to offer other types of instruction, and that the frequency of higher-order questions was positively associated with comprehension outcomes.[183] The third study, which collectively examined students in 3rd through 5th grade, found a correlation between teachers' use of higher-order questions about text (again, in both discussions and writing assignments) and student comprehension.[184] Finally, in the fourth study, Knapp (2006) studied the use of the Question Answer Relationships (QAR) strategy with students in 3rd and 4th grade for whom she was a reading resource teacher.

The study focused on in-depth questions to individual students rather than on the context of group discussion, but it did show a positive association between use of questions and reading comprehension. The studies did not prove the effectiveness of asking students higher-order questions about text, but the panel believes that they point to the use of questions as a promising practice.

Recommendation 4
Select texts purposefully to support comprehension development

Level of evidence: Minimal Evidence

Although the panel believes that implementing Recommendation 4 is an essential part of high-quality reading comprehension instruction, the level of causal evidence to support the recommendation is minimal evidence. Few studies on the relationship between text quality, genre, or difficulty and students' reading comprehension outcomes meet WWC evidence standards. In one exception that did meet WWC standards, Brennan (1982) randomly assigned 2nd-grade students to read two types of narrative texts: texts with a clear structure (well formed) and texts in which the structure was not clearly delineated (poorly formed). The author used two stories, creating well-formed and poorly formed versions of each, and found better comprehension among students exposed to the well-formed text, which clearly laid out the narrative's elements.[185]

To provide some foundation for the part of Recommendation 4 that advises teachers to consider text quality, the panel cited two correlational studies, recognizing that their findings do not prove any reading comprehension benefits of exposing students to high-quality text. In the first, the authors conducted a validity study of an observation system that assesses classroom literacy environments in terms of volume and quality of texts.[186] The authors inventoried texts and observed activities in 33 classrooms (including 25 in kindergarten through 3rd grade), conducting

a multivariate analysis of factors associated with (1) the classroom's text environment, (2) student and teacher engagement with text, and (3) student and teacher interview responses about text. The authors reported a positive correlation between elementary students' reading comprehension achievement and their exposure to texts that were numerous, accessible, engaging, and available at a range of difficulty levels. The second study observed the behavior of students in five 2nd-grade classrooms who were encouraged to select texts freely for independent reading (for an average of 20 minutes per day).[187] Students recorded their reasons for selecting texts and met with the researcher to summarize the text and answer comprehension questions. Equipped with pretest information on each student and knowledge of the vocabulary and comprehension difficulty of the texts selected by students, the author observed a positive association between student interest in a topic and the likelihood of selecting a difficult text on that topic. Drawing on these two studies, the panel concludes that offering students the option of varied and high-quality texts encourages them to read material (including difficult text) that better matches their interests and supports improved comprehension.

The panel relied on two additional studies that used a correlational design and supported its advice to expose students to varied text types (such as narrative and informational) and different genres within each type during comprehension instruction. For example, some genres of narrative text are folktales, historical fiction, and myths, whereas informational genres include textbooks, news articles, and encyclopedia entries. In the first study, Langer (1984) directed students in 3rd, 6th, and 9th grade to read a literary text, write a literary text, read an informational text, and write an informational text. After each activity, students reflected on and recalled the details of the text. The author found minimal variation across grades in the structure of students' responses to and creation of literary texts, although older

students' responses to and creation of informational text were more complex than those of younger students. However, the author noted that students understand the differences between "stories" and "reports" as early as 3rd grade, suggesting the importance of making sure that students engage in an ample number of varied reading experiences so that they learn to differentiate.

The second study, a multivariate analysis of data from the Progress in International Reading Literacy Study (PIRLS), examined the factors associated with a trend among U.S. elementary school readers in which their performance in reading literary texts outpaces their reading of informational texts.[188] The study found a positive association between the quantity of informational text instruction in classrooms and informational reading performance among 4th-grade readers (and a negative relationship between self-initiated informational reading and informational reading performance). Even though the study focused on 4th-grade students and used a general (rather than comprehension-specific) outcome measure, the panel believes that the correlational finding further emphasizes the importance of introducing a variety of text genres in the classroom.

Two other studies reported that students with limited exposure to informational texts during instruction experienced difficulty in writing their own informational texts.[189] Even though the studies focused on writing rather than on reading comprehension outcomes, the panel believes that the findings further highlight the importance of exposure to several text genres.

Recommendation 5
Establish an engaging and motivating context in which to teach reading comprehension

Level of evidence: Moderate Evidence

The panel identified 14 studies that tested the effectiveness of all or part of Recommendation 5.[190] Eight of the studies were randomized

controlled trials that met WWC standards,[191] and one study potentially met standards, but some details were missing from the study, leaving the WWC unable to determine whether the study met standards.[192] The remaining five, which used quasi-experimental designs, met WWC standards with reservations.[193] The six studies that most closely aligned with the panelists' recommendation found substantively important positive effects on reading comprehension.[194] Each of these six studies examined the effectiveness of student motivation in comprehension instruction along with other practices not specifically recommended by the panel, and two of the six experiments included students older than 3rd grade. However, the recommended practices were central to the treatment condition(s) in these six studies and were components of the experimental condition in the remaining studies. Therefore, the panel believes the collective body of evidence provides moderate evidence support for Recommendation 5 to incorporate student motivation in comprehension instruction. Table D.3 summarizes the characteristics of the 14 studies and their alignment with Recommendation 5.

Studies demonstrating positive effects for engaging practices in reading comprehension

Of the 14 studies that contributed to the evidence rating for Recommendation 5, nine showed statistically significant or substantively important positive effects for conditions that included components of Recommendation 5.[195] A tenth study, Morrow, Rand, and Young (1997), primarily investigated the effect of cooperative literacy experiences, although teachers in the treatment condition also encouraged students to retell stories. Missing information on the final sample size prevented the WWC from both determining whether the study met its standards and calculating final effect sizes, although the authors report that the experimental students achieved significantly better scores on recalling, retelling, and rewriting stories than did comparison students. (The other four showed

negative or no detectable effects [described below] of engaging practices, consistent with the panel's moderate evidence rating.)

Six of the 10 studies exhibited close alignment to Recommendation 5 and found substantively important positive effects for students in the engaging condition(s) relative to controls.[196] The first study was a large QED that compared students receiving instruction with CORI to students receiving only comprehension strategy instruction.[197] CORI incorporates all components of Recommendation 5, including the provision of a motivating purpose and opportunities for student success, choice, and collaborative learning.[198] The authors reported that CORI's motivational components produced a substantively important positive effect on reading comprehension relative to students in the strategy-only condition.[199]

Three large RCTs evaluated the effectiveness of a literature-based cooperative learning intervention that included three of the components of Recommendation 5 (all but opportunities for student success) and found substantively important positive comprehension effects.[200] The first compared cooperative learning and cooperative learning plus an at-home component to a control condition (use of the regular basal reader program).[201] Both treatment conditions produced a substantively important positive effect on students' reading comprehension relative to controls; in the case of the cooperative plus at-home condition, effects were significant. The second study found substantively important positive comprehension effects for students in a similar cooperative learning intervention relative to students receiving the regular basal reader instruction.[202] Finally, the third large RCT compared the effectiveness of an integrated science and literacy program, which had many of the same components of the cooperative learning intervention described in the previous two studies, to a control condition of basal reader and science textbook instruction.[203] The experimental condition in this study was characterized by the same three components of the panelists'

recommendation, with more emphasis on conceptual (science-related) themes and less description of cooperative learning practices.

The remaining two studies in this group used a quasi-experimental design to test the effectiveness of Cooperative Integrated Reading and Composition (CIRC) among students in 2nd through 6th grade.[204] CIRC incorporates both motivational instruction and small-group cooperative learning, with activities that include partnered reading, vocabulary review, and retelling; story-related writing; and independent reading of student-chosen books. The authors reported positive and statistically significant effects on reading comprehension outcomes for CIRC students as compared to students in a comparison condition who received typical classroom instruction with a basal reader. (The authors' decision to combine the students across these five grades for analysis was consistent with WWC standards but prevents the panel from assessing whether the CIRC approach would show similar effects in just 2nd and 3rd grade.)

For the six studies described above, the panel cautions that, while each is closely aligned with Recommendation 5, the engaging practices being tested are bundled with other instructional strategies that might have contributed to the intervention's effectiveness. For example, interventions that included conceptual themes for instruction might have contributed to building the background knowledge required for understanding a particular text.[205] Similarly, in some of the cooperative learning interventions, the classroom interventions included instruction in specific comprehension strategies.[206]

Two studies with fair alignment to Recommendation 5 reported positive effects on reading comprehension for students exposed to hands-on learning components relative to students in control conditions.[207] One also compared a whole-class, teacher-directed story dramatization condition and a collaborative, small-group story dramatization condition to a control group that received instruction with

the same literature but without the dramatization component.[208] Both experimental conditions produced large and significant positive effects on the researcher-designed measures relative to the control condition.

Two additional RCTs tested interventions that were only minimally aligned to Recommendation 5, with engaging practices in both tested in combination with other instructional practices recommended by the panel.[209] These studies found substantively important comprehension effects of the experimental conditions. However, the panel acknowledges that conditions combining motivation and engagement with other instructional practices supplement rather than define the evidence for Recommendation 5.

Studies finding no detectable or negative effects for engaging practices on reading comprehension

One of the 14 studies that contributed to the level of evidence for Recommendation 5 produced no detectable effects on reading comprehension.[210] The intervention condition included small-group and paired-reading comprehension activities (partner reading, retelling, and story structure activities) during which teams were rewarded for exhibiting good collaborative behavior (Recommendation 1 in this appendix provides more details).

This study has a fair level of alignment with Recommendation 5.

Three of the 14 studies contributing to the evidence level for Recommendation 5 were fairly aligned to the recommendation and showed negative effects on reading comprehension.[211] Two of these three focused on the effect of a cooperative learning intervention (PALS). The first study compared PALS to individualized tutoring provided by a trained research assistant and showed that the PALS condition produced substantively important negative effects relative to the tutoring condition.[212] The second study compared the effect of PALS to teacher-directed instruction in small groups and found a substantively important negative comprehension effect for the PALS group.[213] For both of these studies, the panel cautions that the negative effect is observed when comparing PALS to some other type of resource-intensive reading instruction (adult tutoring in the first case and small-group instruction in the second). These studies do not measure whether PALS is more effective than typical reading instruction in larger groups. Finally, the third study randomly assigned students to repeated reading of text or repeated reading plus performance feedback and found a substantively important negative reading comprehension effect of the latter condition.[214]

Table D.3. Studies testing the comprehension effects of engaging or motivating students

Study Details				Practices Tested				
Brief Citation	**Study Design**	**Study Size and Population**	**Comprehension Outcome and Effect Size**	**Alignment to Recommendation**[a]	**Motivating Purpose**	**Opportunities for Student Success**	**Student Choice**	**Collaborative Learning Experiences**
Studies Meeting WWC Standards With or Without Reservations								
Studies Showing Positive Comprehension Effects[b]								
Baumann (1986)[c]	RCT	39 students; 3rd grade, Midwest, rural	Researcher-designed tests: +1.59, sig +0.78, sig +0.59, ns +0.88, sig	✓	Lesson purpose			
Baumann and Bergeron (1993)[d]	RCT	74 students; 1st grade, Midwest, rural	Researcher-designed tests: +1.40, sig +0.78, ns +0.82, ns +0.75, ns	✓				Collaborative learning activities
Fizzano (2000)[e]	RCT	100 students; average age 8 years, 4 months; Mid-Atlantic, suburban	Metropolitan Achievement Test: E2 versus E1: −0.06, ns E2 versus C: +0.16, ns E1 versus C: +0.22, ns Researcher-designed tests: E2 versus E1: +0.07, ns; 0.00, ns; −0.26, ns E2 versus C: +2.50, sig; +2.56, sig; +3.27, sig E1 versus C: +2.37, sig; +2.69, sig; +3.65, sig	✓✓	Hands-on activities			Collaborative learning activities, group roles
Guthrie et al. (2004) [Study 2 only][f]	QED	12 classrooms; 3rd grade, Mid-Atlantic, urban	Gates MacGinitie Comprehension: +1.47, ns Researcher-designed test: +0.86, ns	✓✓✓	Elevated role for reading, lots of (varied) texts, interesting topics, conceptual themes, hands-on activities	Knowledge goals, self-efficacy support, scaffolding	Choice of text, topic, and activity within a limited set of options	Collaborative learning activities
Guthrie et al. (2006)	QED	81 students; 3rd grade, Mid-Atlantic	Gates MacGinitie Comprehension: +0.72, ns	✓✓	Hands-on activities			

(continued)

Table D.3. Studies testing the comprehension effects of engaging or motivating students
(continued)

Study Details					Practices Tested			
Brief Citation	**Study Design**	**Study Size and Population**	**Comprehension Outcome and Effect Size**	**Alignment to Recommendation**[a]	**Motivating Purpose**	**Opportunities for Student Success**	**Student Choice**	**Collaborative Learning Experiences**
Morrow (1996)[g]	RCT	6 classrooms; 2nd grade, United States, urban	California Test of Basic Skills: E1 versus C: +0.53, ns E2 versus C: +0.50, ns Researcher-designed test: E1 versus C: +1.81, sig E2 versus C: +1.47, ns	✓✓✓	Elevated role for reading, lots of (varied) books, prominent literacy centers		Choice of books and activities within a limited set of options	Supportive community, group roles, collaborative learning activities
Morrow, Pressley, and Smith (1995)[h]	RCT	6 classrooms; 3rd grade, United States	California Test of Basic Skills: E1 versus C: +0.37, ns E2 versus C: +0.11, ns Researcher-designed test: E1 versus C: +1.63, sig E2 versus C: +0.79, ns	✓✓✓	Elevated role for reading, conceptual themes (science), lots of (varied) books, prominent literacy centers		Choice of books and activities	Collaborative learning activities
Stevens and Slavin (1995a)[i]	QED	45 classrooms; 2nd through 6th grade, United States, suburban Maryland	California Achievement Test–Comprehension: Authors report positive and significant	✓✓✓	Elevated role of reading	Group goals and individual performance recognition	Choice of texts for independent reading (prescribed texts for collaborative reading)	Supportive community, group roles, collaborative learning activities
Stevens and Slavin (1995b)[i]	QED	64 classrooms; 2nd through 6th grade, United States, suburban Maryland	California Achievement Test–Comprehension: Authors report positive and significant	✓✓✓	Elevated role of reading	Group goals and individual performance recognition	Choice of texts for independent reading (prescribed texts for collaborative reading)	Supportive community, group roles, collaborative learning activities
Studies Showing No Detectable Comprehension Effects								
Bramlett (1994)	QED	392 classrooms; 3rd grade, United States, rural	California Achievement Test–Comprehension: +0.10, ns Word Analysis: +0.11, ns	✓✓				Supportive community, collaborative learning activities

(continued)

Table D.3. Studies testing the comprehension effects of engaging or motivating students *(continued)*

Study Details					Practices Tested			
Brief Citation	**Study Design**	**Study Size and Population**	**Comprehension Outcome and Effect Size**	**Alignment to Recommen-dation**[a]	**Motivating Purpose**	**Opportu-nities for Student Success**	**Student Choice**	**Collaborative Learning Experiences**
Studies Showing Negative Comprehension Effects								
Mathes et al. (2003)	RCT	22 classrooms; 1st grade, southeastern United States	Woodcock Reading Mastery Test–Revised, Passage Comprehension: −0.61, ns	✓✓				Supportive community, group roles, collaborative learning activities
McMaster et al. (2005)[j]	RCT	41 students; 1st grade, South, urban	Researcher-designed test: −0.42, ns	✓✓				Supportive community, group roles, collaborative learning activities
Rosenblatt (2004)	RCT	34 students; 3rd grade, Northeast, urban	Woodcock-Johnson III Passage Compre-hension: −0.46, ns	✓✓		Progress-monitoring charts		
Studies Potentially Meeting Standards								
Morrow, Rand, and Young (1997)	RCT	12 classrooms; 1st through 3rd grade, United States, urban	Researcher-designed tests, authors report sig-nificant: +0.49 +0.28 +1.05	✓✓✓	Elevated role for reading, lots of (varied) books, prominent literacy centers		Choice of books, activities, centers, groups, where to read, and response to text, within a limited set of options	Supportive community, group roles, collaborative learning activities

a. Studies with three check marks (close alignment) contained elements of most practices suggested in Recommendation 5 and explicitly tested the impacts of these practices on reading comprehension. Studies with two check marks (fair align-ment) tested the comprehension effects of only one of these practices, either in isolation or in conditions that included other recommended engagement or motivation practices in two or more study conditions. Studies with one check mark (minimal alignment) tested the comprehension effects of only one recommended engagement or motivation practice but in conditions that bundled it with other classroom practices not related to engagement or motivation.

b. Effects are reported as positive if they are significant ($p < 0.05$) or substantively important (effect size ≥ +0.25) according to WWC calculations. The WWC adjusts effect sizes to account for student or classroom clustering and pretest differences between treatment and control group students. Thus, WWC-reported effects may differ from author-reported effects if authors did make such adjustments.

c. **Baumann (1986)** had three study arms, but Appendix D focuses on the comparison between two of them. In the first, focused on strategy, students learned about anaphoric references: pronouns or other words that authors use rather than repeating a word or phrase (e.g., John and Mary went to the movies. *They* had fun *there. They* refers back to John and Mary, and *there* refers to the movies). Teaching in this arm used a five-step approach, beginning by giving a purpose for the lesson. Comparatively, students in the second study arm received instruction in anaphora according to a basal reader. In the third arm of the study, students did not receive any instruction in anaphora; therefore, the comparison between the two anaphoric instruction conditions provides the most direct test of the motivation practice recommended by the panel.

d. **Baumann and Bergeron (1993)** included four conditions: story mapping, story mapping with a writing component, directed reading and thinking activity, and directed reading activity. To calculate these effects, the WWC pooled the two story-mapping conditions and compared them to the other two conditions pooled together.

Table D.3. Studies testing the comprehension effects of engaging or motivating students
(continued)

e. **Fizzano (2000)** reported pre-intervention measures for the treatment and control groups on the Metropolitan Achievement Test, but substantial time elapsed between the baseline test (at the end of students' 2nd-grade year) and the start of the intervention (close to the end of students' 3rd-grade year). Therefore, readers should be aware that differences between the treatment and control groups may have been larger or smaller at the start of the intervention than at the time of the administration of the baseline test. For this study, E1 is experimental group 1 (teacher-directed story dramatization), E2 is experimental group 2 (small-group story dramatization), and C is the control group (traditional reading lessons with same literature as the experimental groups, but no story dramatization). Cooperative learning was tested only in the comparison of E1 and E2.

f. **Guthrie et al. (2004)** reported small baseline differences (0.10 standard deviation) favoring the treatment group on the researcher-designed test. The WWC adjusted for these differences in the reported effect sizes for the researcher-designed test but was unable to control for any differences that may have existed in the Gates MacGinitie test because pre-intervention differences were not reported for this measure. Therefore, the reported effect sizes for the Gates MacGinitie test may overstate the effect of the intervention.

g. **Morrow (1996)** had two experimental conditions: literature-based reading and writing (E1) and the same program plus a reading-at-home component (E2). Both programs were compared to a control condition using a basal reader (C).

h. **Morrow, Pressley, and Smith (1995)** had two experimental conditions: literature-based reading in literacy instruction (E1) and literature-based reading in literacy and science instruction (E2). Both programs were compared to a control condition using a basal reader (C).

i. **Stevens and Slavin (1995a, 1995b)** conducted a combined analysis of students in 2nd through 6th grade and calculated effects that adjusted for (small) baseline differences between the treatment arms in a hierarchical linear model (HLM). This approach differs from the WWC method of calculating effect sizes. Therefore, although the study meets standards with reservations, effect sizes calculated using this method are not presented in the table for the sake of consistency.

j. Although **McMaster et al. (2005)** found Peer-Assisted Learning Strategies (PALS), which is a peer-tutoring intervention, to be less effective than individualized tutoring by a trained research assistant, the panel cautions that the intervention might still have had positive impacts on comprehension compared to the absence of peer or adult tutoring.

Endnotes[a]

1. Following WWC guidelines, improved outcomes are indicated by either a positive statistically significant effect or a positive, substantively important effect size. The WWC defines substantively important, or large, effects on outcomes to be those with effect sizes greater than 0.25 standard deviations. In this guide, the panel discusses substantively important findings as ones that contribute to the evidence of practices' effectiveness, even when those effects are not statistically significant. See the WWC guidelines at http://ies.ed.gov/ncee/wwc/pdf/wwc_procedures_v2_standards_handbook.pdf.

2. For more information, see the WWC Frequently Asked Questions page for practice guides, http://ies.ed.gov/ncee/wwc/references/idocviewer/doc.aspx?docid=15.

3. American Educational Research Association, American Psychological Association, and National Council on Measurement in Education (1999).

4. Ibid.

5. The panel drew this definition of reading comprehension from Snow (2002, p. 11) and believes that it is consistent with other common or more widely used definitions (Harris & Hodges [1995]; National Assessment Governing Board [2008]; Perfetti, Landi, & Oakhill [2005]).

6. Snow (2002).

7. Ibid.

8. http://nces.ed.gov/naal/kf_demographics.asp; according to the Institute of Education Sciences, U.S. Department of Education, in 1992 and again in 2003, approximately 14% of American adults were "below basic" or knew "no more than the most *simple* and *concrete* literacy skills" in "prose literacy" or "the knowledge and skills needed to perform prose tasks (i.e., to search, comprehend, and use continuous texts).

9. National Reading Panel (2000).

10. Hambrick and Engle (2002); Schneider, Körkel, and Weiner (1989).

11. National Early Literacy Panel (2008); National Reading Panel (2000); **Snow, Burns, and Griffin (1998)**.

12. The **National Early Literacy Panel (2008)** conducted a meta-analysis of 30 independent studies of the relationship of oral language skills to reading comprehension in young children. (Across those 30 studies, there were data from approximately 4,000 children.) This analysis indicates a relationship between listening comprehension in kindergarten students and reading comprehension through age 7. In addition, other studies indicate that the correlation between listening comprehension and reading comprehension persists well beyond these ages (Sticht et al. [1974]; Vellutino et al. [2007]).

13. National Reading Panel (2000).

14. In gradual release of responsibility, the teacher models the use of a strategy but across lessons gradually turns over responsibility for carrying out the strategy and providing explanations to students.

15. **Brown et al. (1995)**; **Center et al. (1999)**; **Hansen (1981)**; **McGee and Johnson (2003)**; **Morrow (1984, 1985)**; **Morrow, Pressley, and Smith (1995)**; **Paris, Cross, and Lipson (1984)**; **Reutzel, Smith, and Fawson (2005)**; **Williamson (1989)**.

16. **Brown et al. (1995)**; **Hansen (1981)**; **Paris, Cross, and Lipson (1984)**; **Williamson (1989)**. **Morrow (1984)** also reported positive effects, but there was not enough information in the study to confirm these effects.

17. **Hansen (1981)**.

18. **Brown et al. (1995)**; **Williamson (1989)**. **McGee and Johnson (2003)**; **Morrow (1984)** also reported positive effects, but the WWC could not confirm the authors' report of significance because no standard deviations were provided in the study.

19. **Center et al. (1999)**.

20. **Brown et al. (1995)**.

21. **Brown et al. (1995)**; **Paris, Cross, and Lipson (1984)**; **Williamson (1989)**.

22. **Hansen (1981)**.

23. **McGee and Johnson (2003)**; **Paris, Cross, and Lipson (1984)**.

24. **Brown et al. (1995)**; **Morrow (1985)**; **Morrow, Pressley, and Smith (1995)**; **Williamson (1989)**.

[a]Eligible studies that meet WWC evidence standards or meet evidence standards with reservations are indicated by bold text in the endnotes and references pages. For more information about these studies, please see Appendix D.

25. **Morrow (1985)**.

26. **Brown et al. (1995)**; **Williamson (1989)**.

27. **Reutzel, Smith, and Fawson (2005)**.

28. **Reutzel, Smith, and Fawson (2005)**; **Williamson (1989)**; **McGee and Johnson (2003)**.

29. Students, especially those in younger grades, will not spontaneously understand how to execute these strategies. For example, a kindergartener may not, on his or her own, understand how to visualize. This section offers explicit suggestions for teaching students to visualize and guiding their practice.

30. The table presents only a sample of multiple-strategy formats that are commonly used. Other approaches have been researched but may not have formal names. For example, **McGee and Johnson (2003)** tested the effectiveness of inference training, which incorporates questioning, predicting, and drawing inferences, on comprehension and reported positive results. However, the WWC could not confirm the significance of those effects based on information in the study.

31. As recommended in Duke and Pearson (2002).

32. As described by Duke and Pearson (2002) and Pearson and Gallagher (1983).

33. **Brown et al. (1995)**; **Center et al. (1999)**; **Reutzel, Smith, and Fawson (2005)**; **Williamson (1989)**. Morrow, Rand, and Young (1997) used modeling to teach strategies but did not provide enough information to determine whether the study design meets WWC evidence standards.

34. National Reading Panel (2000); **Reutzel, Smith, and Fawson (2005)**.

35. The classification of text types can often be confusing, and one entirely satisfactory system for arranging all texts does not exist. Also, overlap exists between text types (passages within a story could be largely informational in nature, for example, or a narrative might be embedded in an informational text). Despite the lack of firm category boundaries, some general differences exist between the types of text that matter in children's reading, and it is imperative that students are exposed to a broad range of texts and provided with guidance in making sense of those categories of texts.

36. **Baumann and Bergeron (1993)**; **Morrow (1984)**; Pearson and Camparell (1981).

37. **Baumann and Bergeron (1993)**.

38. Reutzel, Hollingsworth, and Eldredge (1994).

39. Duke (2000).

40. National Assessment Governing Board (2008). Although the National Assessment of Educational Progress (NAEP), for which the National Assessment Governing Board develops the assessment framework, is for 4th grade and higher, the panel believes that teachers in the early grades should bear NAEP expectations in mind as they teach reading comprehension. See Recommendation 4 for additional discussion of text types.

41. Gradual release of responsibility is the process of transitioning students from supported application to independent application and, eventually, subconscious application. For further information, see Recommendation 1.

42. **Baumann and Bergeron (1993)**; **Morrow (1996)**; **Reutzel, Smith, and Fawson (2005)**; **Williams et al. (2007)**; **Morrow (1984)**.

43. **Morrow (1996). Baumann and Bergeron (1993)** also found a positive effect that, although not statistically significant, was substantively important in size.

44. **Williams et al. (2007)**.

45. **Reutzel, Smith, and Fawson (2005)**.

46. Williams et al. (2005); Williams et al. (2009).

47. **Center et al. (1999)**; Davis (1994); Paris and Paris (2007); Reutzel, Hollingsworth, and Eldredge (2001).

48. **Bauman and Bergeron (1993)** found positive comprehension effects of instruction that included this type of presentation. **Center et al. (1999)** also describe how this type of structural instruction may be implemented, but they do not test its effectiveness.

49. Duke (2000).

50. **Morrow (1984)**.

51. Paris and Paris (2007).

52. **Baumann and Bergeron (1993)**.

53. Davis (1994).
54. **Baumann and Bergeron (1993)**.
55. **Baumann and Bergeron (1993)**; **Bramlett (1994)**.
56. **Baumann and Bergeron (1993)**; Reutzel, Hollingsworth, and Eldredge (1994).
57. **Baumann and Bergeron (1993)**; **Morrow (1996)**.
58. **Bramlett (1994)**; Davis (1994); **Morrow (1996)**; Reutzel, Hollingsworth, and Eldredge (1994).
59. **Center et al. (1999)**.
60. Williams et al. (2005).
61. Reutzel, Hollingsworth, and Eldredge (1994); Williams et al. (2005); Williams et al. (2009).
62. Ibid.
63. **Williams et al. (2007)**.
64. Beck, Omanson, and McKeown (1982); **Brown et al. (1995)**; **Morrow (1984)**.
65. **Brown et al. (1995)**.
66. Bitter et al. (2009); Knapp (2006); Taylor et al. (2000); Taylor et al. (2003).
67. Bitter et al. (2009); Knapp (2006).
68. Clark et al. (2003) emphasize selecting texts with conflicts or dilemmas for use in discussion with 4th-grade students; the panel believes this principle is important when selecting texts for discussion in classrooms with younger students as well.
69. National Assessment Governing Board (2008). The panel uses the NAEP framework as one common example of a structure students could use to arrive at a sound and complete interpretation of a text. The panel notes that teachers' primary goal is giving students tools to help them understand increasingly sophisticated material as they progress through school rather than preparing them for tests.
70. Tompkins (2009) offers this example for use with 5th-grade students in a reciprocal questioning activity, but the panel believes that this structure could be adapted for use in the earlier grades as well.
71. **Brown et al. (1995)** include a sample lesson at the end of their study that describes a discussion like this between a teacher and a 2nd-grade class.
72. Beck and McKeown (2006) describe characteristics of higher-order questions.
73. **Morrow (1984)** describes discussion questions to use with students before and after reading. The panel also advocates eliciting discussion as students read.
74. Beck and McKeown (2006).
75. **Brown et al. (1995)**.
76. These question stems were both created by the panel and adapted from examples provided in Beck and McKeown (2006); Beck, Omanson, and McKeown (1982); Michaels, O'Connor, and Resnick (2008); Tompkins (2009); Wolf, Crosson, and Resnick (2006). Reznitskaya et al. (2001) also discuss use of textual evidence in discussions with 5th-grade students.
77. Wolf, Crosson, and Resnick (2006).
78. A teacher described in Klingner and Vaughn (1999) used this approach with 10- and 11-year-old students, and the panel believes it will work with younger students as well.
79. Wiencek and O'Flahavan (1994).
80. For example, teachers and researchers in **Ezell et al. (1992)** implemented extensive peer interaction training on rules and question types, followed by peer-assisted practice sessions on discussing the questions.
81. Wiencek and O'Flahavan (1994).
82. Tompkins (2009).
83. Ibid.
84. As described in Michaels, O'Connor, and Resnick (2008). Wolf, Crosson, and Resnick (2006) observed classroom discussions and noted that teachers who waited little or not at all, and then answered their own questions, did not successfully engage students in discussion.
85. Cervetti, Pearson, and Jaynes (2001) provide these and other examples of teacher scaffolds to help students learn to discuss text.
86. One teacher profiled by Klingner and Vaughn (1999) has 11- and 12-year-old students demonstrate discussion group roles for 8- and 9-year-olds. Then, when the younger students try their own discussion, the older students watch to provide feedback.
87. McIntyre (2007) suggests five practices for getting young students to talk about text:

giving explicit directions, cueing students, scaffolding student talk, responding authentically, and developing a democratic style of teaching that includes collaborative work.

88. **Brennan (1982)**.

89. Hoffman et al. (2004).

90. Langer (1984).

91. Park (2008). Students in this study are older than the target age range for this guide.

92. Halladay (2008).

93. National Assessment Governing Board (2008). Although NAEP is for 4th grade and higher, the panel believes that teachers in the early grades should bear NAEP expectations in mind as they teach reading comprehension.

94. Duke (2000).

95. The classification of text types can often be confusing, and one entirely satisfactory system for arranging all texts does not exist. Poetry is different from other literary texts in that it may not be narrative and may be structured differently. Also, overlap exists between text types (passages within a story could be largely informational in nature, for example, or a narrative might be embedded in an informational text). Despite the lack of firm category boundaries, some general differences exist between the types of text that matter in children's reading, and it is imperative that students are exposed to a broad range of texts and provided with guidance in making sense of those categories of texts.

96. Langer (1984); Park (2008). Similarly, Duke, et al. (2009) and Kamberelis (1999) indicate that students with limited exposure to informational texts in the classroom struggled with writing their own informational texts.

97. Two such lists are Children's Choices, sponsored by the International Reading Association and the Children's Book Council (http://www.reading.org/Resources/Booklists/ChildrensChoices.aspx), and the American Library Association, Association for Library Service to Children (http://www.ala.org/ala/mgrps/divs/alsc/awardsgrants/index.cfm).

98. Halladay (2008).

99. For example, in **Eldredge (1990)**, teachers provided students with books slightly beyond what they could read independently and provided guided support during reading. In Paris and Paris (2007), the researchers provided students with teacher and peer support to help them apply comprehension strategies to texts with difficult levels of vocabulary and decodability.

100. Halladay (2008).

101. In **Guthrie et al. (2004)** and **Eldredge (1990)**, teachers supplemented the reading program with library books and school resources.

102. Snow (2002).

103. **Baumann (1986)**; **Baumann and Bergeron (1993)**; **Fizzano (2000)**; **Guthrie et al. (2004)**; **Guthrie et al. (2006)**; Linnenbrink and Pintrich (2003); **Morrow (1996)**; **Morrow, Pressley, and Smith (1995)**; Morrow, Rand, and Young (1997).

104. Turner (1995).

105. Linnenbrink and Pintrich (2003); Smiley and Dweck (1994); Turner (1995).

106. Smiley and Dweck (1994); Turner (1995).

107. Turner (1995).

108. **Guthrie et al. (2004)**; **Morrow (1996)**; **Morrow, Pressley, and Smith (1995)**; Morrow, Rand, and Young (1997); **Stevens and Slavin (1995a, 1995b)**.

109. **Fizzano (2000)**; **Guthrie et al. (2006)**.

110. **Baumann (1986)**; **Baumann and Bergeron (1993)**.

111. **Bramlett (1994)**; **Mathes et al. (2003)**; **McMaster et al. (2005)**; **Rosenblatt (2004)**.

112. Januik and Shanahan (1988).

113. **Guthrie et al. (2004)**; **Morrow (1996)**; **Morrow, Pressley, and Smith (2005)**; Morrow, Rand, and Young (1997).

114. **Morrow (1996)**; **Morrow, Pressley, and Smith (1995)**; Morrow, Rand, and Young (1997).

115. **Fizzano (2000)**; **Guthrie et al. (2004)**; **Guthrie et al. (2006)**.

116. **Guthrie et al. (2004)**; **Guthrie et al. (2006)**; Morrow, Rand, and Young (1997). The example used in this sentence is from **Guthrie et al. (2004, p. 407)**.

117. **Baumann (1986)**; **Center et al. (1999)**; **Guthrie et al. (2004)**.

118. Pressley et al. (2003).
119. Linnenbrink and Pintrich (2003).
120. Turner (1995).
121. Pressley et al. (2003). In **Guthrie et al. (2004)**, the authors reported that teachers in the treatment condition provided more efficacy support.
122. Pressley et al. (2003).
123. Linnenbrink and Pintrich (2003); Pressley et al. (2003).
124. **Guthrie et al. (2004)**; **Morrow (1996)**; Morrow, Rand, and Young (1997); **Rosenblatt (2004)**; Swan (2003).
125. **Guthrie et al. (2004)**; **Guthrie et al. (2006)**; **Morrow (1996)**; Morrow, Rand, and Young (1997).
126. Ibid.
127. Activity choices adapted from practices in **Morrow (1996)**.
128. **Guthrie et al (2004)**; **Guthrie et al. (2006)**.
129. **Guthrie et al (2004)**; **Guthrie et al. (2006)**; **Morrow (1996)**; **Morrow, Pressley, and Smith (1995)**; Morrow, Rand, and Young (1997).
130. **Guthrie et al. (2004)**.
131. Pressley et al. (2003); Slavin (1990).
132. **Fizzano (2000)**; **McMaster et al. (2005)**; **Morrow (1996)**; Morrow, Rand, and Young (1997).
133. **Morgan, Wilcox, and Eldredge (2000)**. **McMaster et al. (2005)** found that Peer-Assisted Learning Strategies (PALS), a peer tutoring intervention, is less effective than individualized tutoring by a trained research assistant. Although the panel acknowledges that tutoring interventions may produce greater gains than paired reading activities, they believe that paired reading interventions may be particularly useful when the resources are not available to provide tutoring to all students who would benefit from these services.
134. **Bramlett (1994)**; **Morrow (1996)**; Morrow, Rand, and Young (1997).
135. **Bramlett (1994)**.
136. **Keehn (2003)**. In **Morrow, Pressley, and Smith (2005)**, students in two different story dramatization treatments (teacher directed and collaborative groups) have positive effects relative to a business-as-usual control group. No difference in effects is observed between the two treatment groups.
137. **Stevens and Slavin (1995a, 1995b)**. See the WWC practice guide *Reducing Behavior Problems in the Elementary School Classroom* for additional information.
138. See http://www.cori.umd.edu.
139. See Finn (1993) and Finn, Pannozzo, and Voelkl (1995) for more on behavioral engagement.
140. See Connell and Wellborn (1991), Finn (1989), and Skinner and Belmont (1993) for more on emotional engagment.
141. See Connell and Wellborn (1991) and Newmann, Wehlage, and Lamborn (1992) for more on cognitive engagement.
142. See http://www.cori.umd.edu.
143. The gradual release of responsibility model was first introduced by Pearson and Gallagher (1983).
144. Duke (2000).
145. National Assessment Governing Board (2008).
146. Ibid.
147. National Early Literacy Panel (2008).
148. Ibid.
149. Harris and Hodges (1995).
150. Other studies cited in the guide that provided detail on how practices are implemented in the classroom are not discussed here. The panel believes that the studies described in this appendix represent the most relevant investigations of the effectiveness of their recommendations. However, the panel reminds readers that this appendix focuses specifically on the evidence for their recommended practices and is not intended to be an exhaustive accounting of all studies about each practice described within the scope of this guide.
151. One additional study, **Sarasti (2007)** met WWC standards with reservations for causal validity. Using a multiple baseline design, in which the baseline condition was regular classroom instruction, the study introduced groups of students to reciprocal teaching in a staggered fashion. Such a design would be expected to yield a staggered emergence of any effects. However, comprehension

growth spiked suddenly and simultaneously for all groups a few days after the last group began receiving reciprocal teaching. Thus, the WWC was not able to attribute the growth to reciprocal teaching instead of to some confounding factor.

152. Studies typically used some, but not all, elements of gradual release recommended by the panel. As described in the table, in some cases, the WWC could not confirm the positive effects described by the authors because the studies were missing needed information.

153. **Butler (2007)**; **Guthrie et al. (2004)**; **Guthrie et al. (2006)**; **Jones (1987)**.

154. With 10 outcomes, adjustment for multiple comparisons within the comprehension domain means that finding statistically significant results requires extremely large effect sizes. For this study, even the largest positive effect of 1.60 was not statistically significant. In addition, the study found substantively important negative comprehension effects for the activating prior knowledge condition as compared to the inference condition. The panel believes that the comparison indicates that inference instruction may be a superior practice to instruction in activating prior knowledge, but the study still shows that instruction in activating prior knowledge alone can improve reading comprehension relative to no instruction in comprehension strategies. Some pretest gaps between the groups could not be adjusted with a difference-in-difference calculation because pre- and posttest instruments differed, but outcomes for which adjusted means were available were those with some of the largest observed effects.

155. Beck, Omanson, and McKeown (1982); **Morrow (1984)**.

156. **Brown et al. (1995)**.

157. **Paris, Cross, and Lipson (1984)**.

158. **Williamson (1989)**.

159. **Brown et al. (1995)**; **Morrow (1984)**; **Williamson (1989)**.

160. **McGee and Johnson (2003)**.

161. **Center et al. (1999)**.

162. **Brown et al. (1995)**.

163. As described, the WWC adjustment for multiple comparisons across the 10 outcome measures in the reading comprehension domain meant that none of the outcome differences across groups was statistically significant. However, 7 of 10 comprehension outcome effect sizes were larger than 0.25 in the comparison between the inference and control groups, and 8 of 10 were larger than 0.25 in the comparison between the inference group and students trained to activate prior knowledge. Some pretest differences between groups could not be adjusted with a difference-in-difference calculation because pre- and posttest instruments differed, but outcomes for which adjusted means were available were those in which some of the largest effects were observed.

164. **Paris, Cross, and Lipson (1984)**.

165. **McGee and Johnson (2003)**.

166. **Morrow (1985)**.

167. **Brown et al. (1995)**; **Morrow, Pressley, and Smith (1995)**. In **Williamson (1989)**, reciprocal teaching, which includes summarizing, had substantively important effects that were not statistically significant. With three teachers in each study condition, a statistically significant result is difficult to detect.

168. **Brown et al. (1995)**; **Williamson (1989)**. **Paris, Cross, and Lipson (1984)** also examined the comprehension effects of multiple-strategy instruction and found no detectable effects on two of three outcomes, but the panel interprets this with caution because of other instructional practices occurring together in the study condition with multiple-strategy instruction.

169. **McGee and Johnson (2003)**; **Morrow (1984)**.

170. **Center et al. (1999)**; **Hansen (1981)**.

171. **Reutzel, Smith, and Fawson (2005**, **p. 285)**.

172. **Brown et al. (1995)**; **Center et al. (1999)**; **McGee and Johnson (2003)**; **Paris, Cross, and Lipson (1984)**; **Reutzel, Smith, and Fawson (2005)**; **Williamson (1989)**. Morrow, Rand, and Young (1997) describe the use of modeling, which is one component

of gradually releasing responsibility when providing strategies instruction.

173. **McGee and Johnson (2003)**; **Reutzel, Smith, and Fawson (2005)**.

174. Another two causal studies, though they did not test the effectiveness of Recommendation 2, included examples of how a teacher may create story maps. **Center et al. (1999)** conducted a study that study met WWC standards in which students in both the treatment and comparison conditions discussed narrative text structures with their teacher and constructed a story map. Davis (1994) conducted a study that potentially meets WWC standards (but is missing information on attrition that the WWC requires to assign a final rating) in which teachers focused on story maps as a method of organizing narrative text information as well as on presenting and using the map before reading the story. This approach differs from the panel's recommended text structure instruction practices; therefore, the study did not contribute to the evidence base for Recommendation 2 (although it provided helpful examples of story maps).

175. Williams et al. (2005); Williams et al. (2009).

176. In this study, **Bramlett (1994)** reported that the effects were statistically significant. However, after adjusting for clustering of students into classrooms, the WWC did not find the effect to be statistically significant.

177. **Morrow (1996)**.

178. **Morrow (1984)**. The study met WWC standards but lacked the information needed by the WWC to confirm the size and significance of effects.

179. **Reutzel, Smith, and Fawson (2005)**.

180. **Williams et al. (2007)**.

181. **Brown et al. (1995)**.

182. **Morrow (1984)**.

183. Taylor et al. (2000); Taylor et al. (2003). The authors defined schools as "most effective" if students' growth on reading measures (including a retelling measure of comprehension) and their performance on state tests were more than 0.50 standard deviation above the mean for students in their grade at their school.

184. Bitter et al. (2009).

185. This study explored a different issue than Recommendation 2, despite the focus of both on text structure. Recommendation 2 specified the importance of teaching students to recognize how texts are organized and to use this knowledge during their reading. In the Brennan study, the point was not to provide students with teacher guidance in thinking about text structure, but rather to test whether it is more effective to use well-organized texts for instruction than to use poorly organized texts.

186. Hoffman et al. (2004).

187. Halladay (2008).

188. Park (2008).

189. Duke et al. (2009) used a randomized design in 1st-grade classrooms but were missing details that the WWC needed to assess whether the study met standards. Kamberelis (1999) conducted a descriptive study of writing in kindergarten through 2nd grade.

190. The panel also cites three studies that met WWC standards with or without reservations when testing the effectiveness of some instructional practices, but these three did not explicitly test the effectiveness of engaging practices on reading comprehension outcomes: **Center et al. (1999)**; **Keehn (2003)**; **Reutzel, Smith, and Fawson (2005)**. These studies are cited as examples of those practices rather than as evidence of their effectiveness. For example, in **Center et al. (1999)**, the teachers encouraged both the treatment and control groups to identify the purpose for reading comprehension activities.

191. **Baumann (1986)**; **Baumann and Bergeron (1993)**; **Fizzano (2000)**; **Mathes et al. (2003)**; **McMaster et al. (2005)**; **Morrow (1996)**; **Morrow, Pressley, and Smith (1995)**; **Rosenblatt (2004)**.

192. Morrow, Rand, and Young (1997).

193. **Bramlett (1994)**; **Guthrie et al. (2004)**; **Guthrie et al. (2006)**; **Stevens and Slavin (1995a, 1995b)**.

194. **Guthrie et al. (2004)**; **Morrow (1996)**; **Morrow, Pressley, and Smith (1995)**; Morrow, Rand, and Young (1997); **Stevens and Slavin (1995a, 1995b)**.

195. **Baumann (1986)**; **Baumann and Bergeron (1993)**; **Fizzano (2000)**; **Guthrie et al. (2004)**; **Guthrie et al. (2006)**; **Morrow (1996)**; **Morrow, Pressley, and Smith (1995)**; Morrow, Rand, and Young (1997); **Stevens and Slavin (1995a, 1995b)**.

196. **Guthrie et al. (2004)**; **Morrow (1996)**; **Morrow, Pressley, and Smith (1995)**; **Stevens and Slavin (1995a, 1995b)**. Morrow, Rand, and Young (1997) also reported positive effects but was rated as potentially meets standards due to missing information.

197. **Guthrie et al. (2004)** summarize two studies: one that meets WWC evidence standards with reservations and one that does not meet standards. Only one of two comparisons in the second study is cited as evidence of effectiveness of the panel's recommendation. The first study fails to meet evidence standards because it uses a quasi-experimental design in the absence of the author establishing that the study groups are equivalent at baseline. The second study meets evidence standards with reservations, and the panel focuses on the comparison within the study of CORI to strategy instruction, as the CORI versus no-intervention comparison fails to meet WWC standards because the no-intervention comparison is confounded with the single school in which the intervention was absent.

198. CORI also includes multiple-strategy instruction. Detailed descriptions of CORI are available in Guthrie et al., (1999); **Guthrie et al. (2004)**; **Guthrie et al. (2006)**; Guthrie and McCann (1998).

199. The reported effects may overstate the size of the impact of this intervention because the baseline differences between the treatment and comparison groups favored the treatment group. Although the WWC was able to adjust the researcher-designed outcome to account for the baseline differences, the Gates-MacGinitie outcome could not be adjusted because it was not administered at pretest.

200. **Morrow (1996)**; **Morrow, Pressley, and Smith (1995)**. Morrow, Rand, and Young (1997) reported positive effects but was rated as potentially meets standards due to missing information.

201. **Morrow (1996)**.

202. Morrow, Rand, and Young (1997) reported significant positive effects for the treatment group relative to controls, but the study did not report information on the number of students in each condition in the analysis sample. Therefore, the WWC cannot confirm whether the effects would be significant after adjusting for the clustering of students into classrooms.

203. **Morrow, Pressley, and Smith (1995)**.

204. **Stevens and Slavin (1995a, 1995b)**.

205. **Guthrie et al. (2004)**.

206. **Morrow (1996)**; **Morrow, Pressley, and Smith (1995)**; Morrow, Rand, and Young (1997); **Stevens and Slavin (1995a, 1995b)**.

207. **Fizzano (2000)**; **Guthrie et al. (2006)**. In the latter study, both the treatment and control groups received instruction in CORI. The treatment group teachers, however, provided more hands-on "stimulating" tasks than did teachers in the control group. As a result, the intervention did not test the effectiveness of the CORI intervention as a whole but rather the effect of the infusion of more stimulating tasks in the CORI model. The authors reported significant effects, but the WWC did not find significant effects after correcting for clustering and was unable to adjust for baseline differences between groups.

208. **Fizzano (2000)**. There was no detectable difference in the effect of the two dramatization conditions, but the panel focused on the comparison to the no-dramatization control.

209. **Baumann (1986)**. In **Baumann and Bergeron (1993)**, WWC reviewers combined the two story-mapping conditions and compared them to combined DRTA and directed reading activity controls. The comparisons of individual conditions did not meet WWC standards because the effects of each intervention were confounded with the effects of classroom teachers. Moreover, the students in each treatment group all had the same classroom teacher, who was unique to that treatment. The authors reported all effects as significant, but the WWC did not find significant effects after correcting for clustering and multiple comparisons.

210. **Bramlett (1994)**. The author reported significant effects, but the WWC cannot replicate them (even without required WWC adjustments).

211. **Mathes et al. (2003)**; **McMaster et al. (2005)**; **Rosenblatt (2004)**.

212. **McMaster et al. (2005)**. The rating applies only to the comparison of PALS to tutoring. The modified PALS group had high attrition and was not equivalent to comparison groups at baseline. This guide discusses only the results from the PALS/tutoring comparison.

213. **Mathes et al. (2003)**. This study also examined the difference in comprehension effect between the PALS group and a contrast group of students who received their usual instruction, but assignment to those conditions used a quasi-experimental design and resulted in groups that were not equivalent on reading comprehension before PALS began, so the PALS versus contrast group comparison does not meet WWC evidence standards.

214. **Rosenblatt (2004)**. The negative effect adjusts for the baseline differences between the two groups.

References[a]

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (1999). *The standards for educational and psychological testing.* Washington, DC: American Educational Research Association Publications.

American Psychological Association. (2002). Criteria for practice guideline development and evaluation. *American Psychologist, 57*(12), 1048–1051.

Baumann, J. F. (1986). Teaching third-grade students to comprehend anaphoric relationships: The application of a direct instruction model. *Reading Research Quarterly, 21*(1), 70–90.

Baumann, J. F., & Bergeron, B. S. (1993). Story map instruction using children's literature: Effects on first graders' comprehension of central narrative elements. *Journal of Reading Behavior, 25*(4), 407–437.

Beck, I. L., & McKeown, M. G. (2006). *Improving comprehension with Questioning the Author: A fresh and expanded view of a powerful approach.* New York: Scholastic, Inc.

Beck, I. L., Omanson, R. C., & McKeown, M. G. (1982). An instructional redesign of reading lessons: Effects on comprehension. *Reading Research Quarterly, 17*(4), 462–481.

Bitter, C., O'Day, J., Gubbins, P., & Socias, M. (2009). What works to improve student literacy achievement? An examination of instructional practices in a balanced literacy approach. *Journal of Education for Students Placed at Risk, 14*(1), 17–44.

Bloom, B. S. (Ed.) (1956). *Taxonomy of educational objectives.* Handbook I: *Cognitive domain.* White Plains, NY: Longman.

Bramlett, R. K. (1994). Implementing cooperative learning: A field study evaluating issues for school-based consultants. *Journal of School Psychology, 32*(1), 67–84.

Brennan, A. D. H. (1982). *Children's story recall as an effect of structural variation of text.* Unpublished doctoral dissertation, University of Kentucky, Lexington.

Brown, R., & Coy-Ogan, L. (1993). The evolution of transactional strategies instruction in one teacher's classroom. *The Elementary School Journal, 94*(2), 221–233.

Brown, R., Pressley, M., Van Meter, P., & Schuder, T. (1995). *A quasi-experimental validation of transactional strategies instruction with previously low-achieving, second-grade readers* (Reading Research Report no. 33). Athens, GA: National Reading Research Center.

Butler, T. W. (2007). Vocabulary and comprehension with students in primary grades: A comparison of instructional strategies. *Dissertation Abstracts International, 68*(6), 3783.

Center, Y., Freeman, L., Robertson, G., & Outhred, L. (1999). The effect of visual imagery training on the reading and listening comprehension of low listening comprehenders in Year 2. *Journal of Research in Reading, 22*(3), 241–256.

Cervetti, G. M., Pearson, P. D., & Jaynes, C. (2001). *Discourse conventions: Helping students learn to talk about text.* Unpublished paper, University of California–Berkeley.

Clark, A-M., Anderson, R. C., Kuo, L., Kim, I., Archodidou, A., & Nguyen-Jahiel, K. (2003). Collaborative reasoning: Expanding ways for children to talk and think in school. *Educational Psychology Review, 15*(2), 181–198.

Connell, J. P., & Wellborn, J. G. (1991). Competence, autonomy, and relatedness: A motivational analysis of self-system processes. *Minnesota Symposium on Child Psychology, 23,* 43–77.

Dandeles, D. J. (1996). A comparative investigation of reciprocal teaching and teacher directed strategies designed to enhance social skills. *Dissertation Abstracts International, 56*(12), 4702.

[a]Eligible studies that meet WWC evidence standards or meet evidence standards with reservations are indicated by bold text in the endnotes and references pages. For more information about these studies, please see Appendix D.

Davis, Z. T. (1994). Effects of prereading story mapping on elementary readers' comprehension. *Journal of Educational Research, 87*(6), 353–360.

Duke, N. K. (2000). 3.6 minutes per day: The scarcity of informational texts in first grade. *Reading Research Quarterly, 35*(2), 202–224.

Duke, N. K., Martineau, J. A., Frank, K. A., & Bennett-Armistead, V. S. (2009). *The impact of including more informational text in first grade classrooms*. Unpublished.

Duke, N. K., & Pearson, P. D. (2002). Effective practices for developing reading comprehension. In A. E. Farstup & S. J. Samuels (Eds.), *What research has to say about reading instruction* (3rd ed., pp. 205–242). Newark, DE: International Reading Association.

Eldredge, J. L. (1990). Increasing the performance of poor readers in the third grade with a group-assisted strategy. *Journal of Educational Research, 84*(2), 69–77.

Ezell, H. K., Kohler, F. W., Jarzynka, M., & Strain, P. S. (1992). Use of peer-assisted procedures to teach QAR reading comprehension strategies to third-grade children. *Education and Treatment of Children, 15*(3), 205–227.

Finn, J. D. (1989). Withdrawing from school. *Review of Educational Research, 59,* 117–142.

Finn, J. D. (1993). *School engagement & students at risk*. Washington, DC: National Center for Education Statistics.

Finn, J., Pannozzo, G., & Voelkl, K. (1995). Disruptive and inattentive-withdrawn behavior and achievement among fourth graders. *Elementary School Journal, 95*, 421–454.

Fizzano, W. J., Jr. (2000). The impact of story drama on the reading comprehension, oral language complexity, and the attitudes of third graders. *Dissertation Abstracts International, 60*(11), 3908.

Guthrie, J. T., Anderson, E., Alao, S., & Rinehart, J. (1999). Influences of concept-oriented reading instruction on strategy use and conceptual learning from text. *Elementary School Journal, 99*(4), 343–366.

Guthrie, J. T., & McCann, A. D. (1998). Characteristics of classrooms that promote motivations and strategies for learning. In J. T. Guthrie & A. Wigfield (Eds.), *Reading engagement: Motivating readers through integrated instruction* (2nd ed., pp. 128–148). Newark, DE: International Reading Association.

Guthrie, J. T., Wigfield, A., Barbosa, P., Perencevich, K. C., Taboada, A., Davis, M. H., et al. (2004). Increasing reading comprehension and engagement through concept-oriented reading instruction. *Journal of Educational Psychology, 96*(3), 403–423.

Guthrie, J. T., Wigfield, A., Humenick, N. M., Perencevich, K. C., Taboada, A., & Barbosa, P. (2006). Influences of stimulating tasks on reading motivation and comprehension. *The Journal of Educational Research, 99*(4), 232–245.

Halladay, J. L. (2008). *Difficult texts and the students who choose them: The role of text difficulty in second graders' text choices and independent reading experiences*. Unpublished doctoral dissertation, Michigan State University, East Lansing.

Hambrick, D. Z., & Engle, R. W. (2002). Effects of domain knowledge, working memory capacity, and age on cognitive performance: An investigation of the knowledge-is-power hypothesis. *Cognitive Psychology, 44*(4), 339–387.

Hansen, J. (1981). The effects of inference training and practice on young children's reading comprehension. *Reading Research Quarterly, 16*(3), 391–417.

Harris, T. L., & Hodges, R. E. (Eds.). (1995). *The literacy dictionary*. Newark, DE: International Reading Association.

Hoffman, J. V., Sailors, M., Duffy, G. R., & Beretvas, S. N. (2004). The effective elementary classroom literacy environment: Examining the validity of the TEX-IN3 observation system. *Journal of Literacy Research, 36*(3), 303–334.

Januik, D. M., & Shanahan, T. (1988). Applying adult literacy practices in primary grade

instruction. *The Reading Teacher, 41*(9), 880–886.

Jones, M. P. (1987). *Effects of the recipro-cal teaching method on third graders' decoding and comprehension abilities.* Unpublished doctoral dissertation, Texas A&M University, College Station.

Kamberelis, G. (1999). Genre development and learning: Children writing stories, science reports, and poems. *Research in the Teaching of English, 33*, 403–460.

Keehn, S. (2003). The effect of instruction and practice through Readers Theatre on young readers' oral reading fluency. *Reading Research and Instruction, 42*(4), 40–61.

Klingner, J. K., & Vaughn, S. (1999). Promoting reading comprehension, content learning, and English acquisition through Collaborative Strategic Reading (CSR). *The Reading Teacher, 52*(7), 738–747.

Knapp, J. L. (2006). *Increasing reading comprehension using the Question-Answer Relationships (QAR) strategy.* Unpublished master's thesis, Graceland University, Cedar Rapids, IA.

Langer, J. A. (1984). *Children's sense of genre: A study of performance on parallel reading and writing tasks* (Report No. NIE-G-82-0025). Washington, DC: National Institute of Education.

Linnenbrink, L. A., & Pintrich, P. R. (2003). The role of self-efficacy beliefs in student engagement and learning in the classroom. *Reading & Writing Quarterly, 19*, 119–137.

Mathes, P. G., Torgesen, J. K., Clancy-Menchetti, J., Santi, K., Nicholas, K., Robinson, C., et al. (2003). A comparison of teacher-directed versus peer-assisted instruction to struggling first-grade readers. *The Elementary School Journal, 103*(5), 459–479.

McGee, A., & Johnson, H. (2003). The effect of inference training on skilled and less skilled comprehenders. *Educational Psychology, 23*(1), 49–59.

McIntyre, E. (2007). Story discussion in the primary grades: Balancing authenticity and explicit teaching. *The Reading Teacher, 60*(7), 610–620.

McMaster, K. L., Fuchs, D., Fuchs, L. S., & Compton, D. L. (2005). Responding to nonresponders: An experimental field trial of identification and intervention methods. *Exceptional Children, 71*(4), 445–463.

Michaels, S., O'Connor, C., & Resnick, L. B. (2008). Deliberative discourse idealized and realized: Accountable talk in the classroom and in civic life. *Studies in Philosophy and Education, 27*(4), 283–297.

Morgan, A., Wilcox, B. R., & Eldredge, J. L. (2000). Effect of difficulty levels on second-grade delayed readers using dyad reading. *The Journal of Educational Research, 94*(2), 113–119.

Morrow, L. M. (1984). Reading stories to young children: Effects of story structure and traditional questioning strategies on comprehension. *Journal of Reading Behavior, 16*(4), 273–288.

Morrow, L. M. (1985). Retelling stories: A strategy for improving young children's comprehension, concept of story structure, and oral language complexity. *The Elementary School Journal, 85*(5), 646–661.

Morrow, L. M. (1996). *Motivating reading and writing in diverse classrooms: Social and physical contexts in a literature-based program* (NCTE Research Report no. 28). Urbana, IL: National Council of Teachers of English.

Morrow, L. M., Pressley, M., & Smith, J. K. (1995). *The effect of a literature-based program integrated into literacy and science instruction on achievement, use, and attitudes toward literacy and science* (Reading Research Report no. 37). College Park, MD: National Reading Research Center.

Morrow, L. M., Rand, M. K., & Young, J. (1997). *Differences between social and literacy behaviors of first, second, and third graders in social cooperative literacy settings.* New Brunswick, NJ: Rutgers University.

National Assessment Governing Board. (2008). *Reading framework for the 2009 National Assessment of Educational Progress.* Washington, DC: U.S. Department of Education.

National Early Literacy Panel. (2008). *Developing early literacy: Report of the National Early Literacy Panel: A scientific synthesis of early literacy development and implications for intervention*. Washington, DC: National Institute for Literacy.

National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH Publication No. 00-4769). Washington, DC: National Institute of Child Health and Human Development.

Newmann, F. M., Wehlage, G. G., & Lamborn, S. D. (1992). The significance and sources of student engagement. In F. M. Newmann (Ed.), *Student engagement and achievement in American secondary schools* (pp. 11–39). New York: Teachers College Press.

Palincsar, A. S. (1986). Reciprocal teaching. In A. S. Palincsar, D. S. Ogle, B. F. Jones, & E. G. Carr (Eds.), *Teaching reading as thinking*. Oak Brook, IL: North Central Regional Educational Laboratory.

Paris, A. H., & Paris, S. G. (2007). Teaching narrative comprehension strategies to first graders. *Cognition and Instruction, 25*(1), 1–44.

Paris, S. G., Cross, D. R., & Lipson, M. Y. (1984). Informed strategies for learning: A program to improve children's reading awareness and comprehension. *Journal of Educational Psychology, 76*(6), 1239–1252.

Park, Y. (2008). *Patterns in and predictors of elementary students' reading performance: Evidence from the data of the Progress in International Reading Literacy Study (PIRLS)*. Unpublished doctoral dissertation, Michigan State University, East Lansing.

Pearson, P. D., & Camparell, K. (1981). Comprehension of text structures. In J. Guthrie (Ed.), *Comprehension and teaching* (4th ed., pp. 27–54). Newark, DE: International Reading Association.

Pearson, P. D., & Gallagher, M. C. (1983). *The instruction of reading comprehension* (Technical Report no. 297). Champaign, IL: Center for the Study of Reading, University of Illinois at Urbana-Champaign.

Perfetti, C. A., Landi, N., & Oakhill, J. (2005). The acquisition of reading comprehension skill. In M. J. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 227–247). Oxford: Blackwell.

Pressley, M., Burkell, J., Cariglia-Bull, T., Lysynchuk, L., McGoldrick, J. A., Shneider, B., et al. (1990). *Cognitive strategy instruction that really improves children's academic performance.* Cambridge, MA: Brookline Books.

Pressley, M., Dolezal, S. E., Raphael, L. M., Mohan, L., Roehrig, A. D., & Bogner, K. (2003). *Motivating primary-grade students*. New York: Guilford Press.

Reutzel, D. R., Hollingsworth, P. M., & Eldredge, J. L. (1994). Oral reading instruction: The impact on student reading development. *Reading Research Quarterly, 29*(1), 40–62.

Reutzel, D. R., Smith, J. A., & Fawson, P. C. (2005). An evaluation of two approaches for teaching reading comprehension strategies in the primary years using science information texts. *Early Childhood Research Quarterly, 20,* 276–305.

Reznitskaya, A., Anderson, R. C., McNurlen, B., Nguyen-Jahiel, K., Archodidou, A., & Kim, S. (2001). Influence of oral discussion on written argument. *Discourse Processes, 32*(2–3), 155–175.

Rosenblatt, M. L. (2004). Examining the efficacy of combined reading interventions: A group application of skill-based and performance-based interventions. *Dissertation Abstracts International, 65*(06A), 120–2140.

Sarasti, I. A. (2007). *The effects of reciprocal teaching comprehension-monitoring strategy on 3rd grade students' reading comprehension.* Unpublished doctoral dissertation, University of North Texas, Denton, TX.

Schneider, W., Körkel, J., & Weiner, F. E. (1989). Domain-specific knowledge and memory performance: A comparison of high- and low-aptitude children. *Journal of Educational Psychology, 81*(3), 306–312.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement

across the school year. *Journal of Educational Psychology, 85*, 571–581.

Slavin, R. E. (1990). *Cooperative learning: Theory, research, & practice*. Englewood, NJ: Prentice Hall.

Smiley, P. A., & Dweck, C. S. (1994). Individual differences in achievement goals among young children. *Child Development, 65*, 1723–1743.

Snow, C. E. (2002). *Reading for understanding: Toward an R & D program in reading comprehension*. Santa Monica, CA: Rand.

Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academies Press.

Stevens, R. J., & Slavin, R. E. (1995a). Effects of a cooperative learning approach in reading and writing on academically handicapped and non-handicapped students. *Elementary School Journal, 95*(3), 241–262.

Stevens, R. J., & Slavin, R. E. (1995b). The cooperative elementary school: Effects on students' achievement, attitudes and social relations. *American Educational Research Journal, 32*(2), 321–351.

Sticht, T. G., Beck, L. J., Hauke, R. N., Kleiman, G. M., & James, J. H. (1974). *Auding and reading: A developmental model*. Alexandria, VA: Human Resources Research Organization.

Swan, E. A. (2003). *Concept-Oriented Reading Instruction: Engaging classrooms, lifelong learners*. New York: Guilford Press.

Taylor, B. M., Pearson, P. D., Clark, K., & Walpole, S. (2000). Effective schools and accomplished teachers: Lessons about primary-grade reading instruction in low-income schools. *Elementary School Journal, 101*(2), 121–166.

Taylor, B. M., Pearson, P. D., Peterson, D. S., & Rodriguez, M. C. (2003). Reading growth in high-poverty classrooms: The influence of teacher practices that encourage cognitive engagement in literacy learning. *Elementary School Journal, 104*(1), 3–28.

Tompkins, G. E. (2009). *50 literacy strategies: Step by step* (3rd ed.). Boston: Allyn & Bacon/Pearson.

Turner, J. C. (1995). The influence of classroom contexts on young children's motivation for literacy. *Reading Research Quarterly, 30*(3), 410–441.

Vaughn, S., Chard, D. J., Bryant, D. P., Coleman, M., Tyler, B. J., Linan-Thompson, S., et al. (2000). Fluency and comprehension interventions for third-grade students. *Remedial and Special Education, 21*(6), 325–335.

Vellutino, F. R., Tunmer, W. E., Jaccard, J. J., & Chen, R. S. (2007). Components of reading ability: Multivariate evidence for a convergent skills model of reading development. *Scientific Studies of Reading, 11*(1), 3–32.

Wiencek, J., & O'Flahavan, J. F. (1994). From teacher-led to peer discussions about literature: Suggestions for making the shift. *Language Arts, 71*(7), 488–498.

Williams, J. P., Hall, K. M., Lauer, K. D., Stafford, K. B., DeSisto, L. A., & DeCani, J. S. (2005). Expository text comprehension in the primary grade classroom. *Journal of Educational Psychology, 97*(4), 538–550.

Williams, J. P., Nubla-Kung, A. M., Pollini, S., Stafford, K. B., Garcia, A., & Snyder, A. E. (2007). Teaching cause-effect text structure through social studies content to at-risk second graders. *Journal of Learning Disabilities, 40*(2), 111–120.

Williams, J. P., Staggord, K. B., Lauer, K. D., Hall, K. M., & Pollini, S. (2009). Embedding reading comprehension training in content-area instruction. *Journal of Educational Psychology, 101*(1), 1–20.

Williamson, R. A. W. (1989). The effect of reciprocal teaching on student performance gains in third-grade basal reading instruction. *Dissertation Abstracts International, 50*(10A), 81–3147.

Wolf, M. K., Crosson, A. C., & Resnick, L. B. (2006). Accountable talk in reading comprehension instruction (CSE Technical Report 670). University of California–Los Angeles, National Center for Research on Evaluation, Standards, and Student Testing.