This page is intended to give teachers a resource for obtaining class-wide or individual interventions that have been found to meet the criteria for "evidence-based" as required in the determination of a student's responsiveness to intervention. Interventions are provided below in a variety of categories to meet your needs. For example, you might search according to the level of intensiveness. A ***low intensity*** intervention might be one that could be used as part of your universal instruction to an entire class. A ***moderate intensity*** intervention would be perhaps targeted to a subset or small group of students within your class. ***High intensity*** might be best-suited for one-to-one administration. Additionally, there are interventions that are searchable by appropriateness to grade level.

Academic Interventions

By area and intensity

Intensity Area	Low (Class-wide)	Moderate (Supported)	High
Reading			
- Comprehension	Activating Prior Learning Anticipation Reading Guide Conversing with the Writer SQ3R Method for Textbook Readings Mining Information from Text Previewing the Chapter Question-Answer Relationships Reading Actively	Advanced Story Map Keyword: Memorization Strategy Student Comprehension Self-Check Main-Idea Maps Mental Imagery: Improving Recall Oral Recitation Lesson Prior Knowledge Question Generation Reciprocal Teaching Text Lookback	
- Decoding	Drilling Error Words Tackling Multi-syllabic Words Teach a Hierarchy of Strategies	Rewards Word Attack Program	Start Making a Reader Today (SMART)
- Fluency	Using Corrective Feedback Paired Reading Repeated Reading	Assisted Reading Practice Peer Tutor Training Listening Passage Preview Paired Reading Repeated Reading	QuickReads
- General Instruction	Reading Centers	NA	NA

- Phonemic Awareness	Teaching Phonemic Awareness		
- Phonological Awareness	Teaching Strategies	Lindamood Phoneme Sequencing Program (LiPS)	Lindamood Phonemic Sequencing Tutoring
- Vocabulary Development		Cover-Copy-Compare Peer-Assisted Learning	Cover-Copy-Compare Peer-Assisted Learning
Math			
- Computation	Explicit Time-Drills Errorless Learning Worksheets Jump-Start Academic Responding Direct Instruction Implicit Instruction	Cover-Copy-Compare Incremental Rehearsal Problem Interspersal Self-Monitoring & Performance Feedback Access to Division	Access to Division
- Fluency	Balance Massed & Distributed Practice Math Fact Fluency		
- General Instruction	Peer-Guided Pause Using Response Cards Encourage Classroom "Math Talk" Wrap-Around Instruction Plan Differentiated Instruction for Math Direct Instruction in Math Implicit/Strategy Instruction Math Graphic Organizers Web-based Resources	Concrete-Representational-Abstract Instructional Approach Peer Tutoring	
- Reasoning	Draw to Clarify Understanding Four-Step Problem-Solving Approach Using Self-Correction Checklist Math Vocabulary: Preteach Concrete-Representational-Abstract (CRA)	Question-Answer Relationships Math Problem Solving – Lower Elementary Math Problem Solving – Upper Elementary Math Problem Solving – Middle School	

	Math Learning Strategies		
Written Language			
- General Instruction	Memorize a Story Grammar Checklist Essentials Help for Struggling Writers Stimulate Interest w/ Autobiography		
- Spelling	Spelling Study Strategy Self-Correction Methods	Cover-Copy-Compare	
- Written Expression	Defends composition strategy Helpers comparison strategy Mapping writing strategy PLEASE metacognitive strategy POWER organizational strategy PROJECT strategy (adolescents) SCORE A: research paper writing SPACE planning strategy	Defends composition strategy Helpers comparison strategy Mapping writing strategy PLEASE metacognitive strategy POWER organizational strategy PROJECT strategy (adolescents) SCORE A: research paper writing SPACE planning strategy W-W-W composition strategy	
- Writing Fluency	Daily Writing Self-Monitoring and Graphing		
General Academic Strategies			
- Test Taking	Math: Test-Preparation Strategies		
- Non-participation	Using Class Journaling		

By grade level and skill area

(Note: These links are to manuals in .PDF format from the Florida Center for Reading Research, but each one contains many, many strategies and reproducible materials.)

Grades Area	Kindergarten-First	Second-Third	Fourth-Fifth
Phonological Awareness			
	Rhyme and Alliteration	Phoneme Matching and Isolating	NA

	Sentence Segmentation, Syllables, Onset & Rime Phoneme Matching Phoneme Isolating, Phoneme Segmenting Phoneme Segmentation, Blending, Manipulating	Phoneme Blending and Segmenting Phoneme Manipulating	
Phonics			
	Letter Recognition Letter-Sound Correspondence Onset and Rime Encoding and Decoding High Frequency Words Variant Correspondences Syllable Patterns, Morpheme Structures	Letter-Sound Correspondence High Frequency Words Variant Correspondences Syllable Patterns Morpheme Structures	Variant Correspondences Syllable Patterns Morpheme Structures
Fluency			
	Comprehensive Manual (Includes: Letter Recognition, Letter-Sound Correspondence, High Frequency Words, and Oral Reading	Letter-Sound Correspondence Words Phrases and Chunked Text Connected Text	Word Parts and Words Phrases, Chunked Text, Connected Text
Comprehension			
	Comprehensive Manual (Includes Sentence Structure and Meaning, Monitoring for Meaning, Story Structure, and Main Idea/Summarizing)	Narrative Text Structure Expository Text Structure Text Analysis Monitoring for Understanding	Narrative Text Structure Expository Text Structure Text Analysis Monitoring for Understanding
Vocabulary			
	Comprehensive Manual (Includes Word Identification/Words in Context, Word Categorization/Word Knowledge, Words that Describe/Word meaning, and Word Structure/Word Analysis)	Word Knowledge Morphemic Elements Word Meaning Word Analysis Words in Context	Word Knowledge Morphemic Elements Word Meaning and Analysis Words in Context

Behavioral Interventions

Goal Area	↑ Desired Behavior	↓ Problem Behavior
- Disruptive Behavior	Good Behavior Game	Good Behavior Game
- Dropping out/School Refusal	Check and Connect	
General Strategies		
	Positive Reinforcement Differential Reinforcement Behavior Momentum Group Reinforcement Token Economy	Behavioral Contract Response Cost Overcorrection Required Relaxation Extinction (caution)
	Critters: Reinforcing Behavior Mystery Motivator Positive Peer Report Random Teacher Attention Response Effort Helping Victims of Bullying	Working with Defiant Students Points for Grumpy Response-Cost Lottery Response Effort Rubber Band Intervention Strategies for Emotional Students Talk Ticket Menu of Behavioral Strategies Managing Bullying Behavior Classroom Noise Reduction

Links to Sites with Evidence-Based Interventions

If you aren't quite finding what you need in the lists above, then browse some of the sites below. They provide extensive information about evidence-based interventions as well as tools that might be helpful in creating materials for interventions.

Best Evidence Encyclopedia

Florida Center for Reading Research

Social Programs That Work

Intervention Central

Cognitive Strategy Instruction

Blueprints for Violence Prevention

What Works Clearinghouse

Promising Practices Network

Scientifically Based Research

Independent Practice: Set Up Reading Centers *(Florida Center for Reading Research, 2005)*

School-Based Intervention Idea from www.interventioncentral.org

When students have mastered a reading skill, they can work independently at reading centers to practice and become more fluent in that skill under the watchful eye of the teacher.

The reading center is set up with fun and engaging activities designed to extend and reinforce literacy content presented by the teacher. Students work on independent reading-related activities individually or in pairs or groups. As examples of reading center choices, students may listen to taped books, read alone or to each other, use magnetic letters to spell a specified list of words, or create storyboards or comic strips that incorporate pictures and words. Each reading center activity is tied to specific student literacy goals. The activities in reading centers may change often to give children a chance to practice new skills and to keep the content of these centers fresh and engaging.

References

Florida Center for Reading Research (2005). Student center activities: Teacher resource guide. Retrieved August 20, 2006, from http://www.fcrr.org/Curriculum/pdf/TRG_Final_Part1.pdf

Activating Prior Knowledge *(Hansen, & Pearson, 1983)*

School-Based Intervention Idea from www.interventioncentral.org

The instructor demonstrates to students how they can access their prior knowledge about a topic to improve comprehension of an article or story.

The instructor first explains the benefit of using prior knowledge. The instructor tells students that recalling their prior experiences (“their own life”) can help them to understand the content of their reading--because new facts make sense only when we connect them to what we already know. Next, the instructor demonstrates the text prediction strategy to the class by selecting a sample passage (displayed as an overhead) and using a “think-aloud” approach to illustrate the strategy steps: STEP 1: THINK ABOUT WHAT AND WHY: The teacher connects the article to be read with the instructor's own prior knowledge about the topic. The teacher might say, for example, “I am about to read a short article about [topic]. Before I read the article, though, I should think about my life experiences and what they might tell me about [topic]. By thinking about my own life, I will better understand the article.” STEP 2: SELECT MAIN IDEAS FROM THE ARTICLE TO POSE PRIOR-KNOWLEDGE AND PREDICTION QUESTIONS. The teacher chooses up to 3 main ideas that appear in the article or story. For each key idea, the instructor poses one question requiring that readers tap their own prior knowledge of the idea (e.g., “What are your own attitudes and experiences about [idea]?”) and another that prompts them to predict how the article or story might deal with the idea (e.g., "What do you think the article will say about [idea]?"). STEP 3: HAVE STUDENTS READ THE ARTICLE INDEPENDENTLY. Once the teacher has primed students' prior knowledge by having them respond to the series of prior-knowledge and prediction questions, students read the selection independently.

References

Hansen, J. & Pearson, P.D. (1983). An instructional study: Improving the inferential comprehension of good and poor fourth-grade readers. Journal of Educational Psychology, 75, 821-829.

Advanced Story Map

School-Based Intervention Idea from www.interventioncentral.org

Students are taught to use a basic 'Story Grammar' to map out, identify and analyze significant components of narrative text (e.g., fiction, biographies, historical accounts). Reserve at least a full instructional session to introduce this comprehension strategy. (For effective-teaching tips, consult the guidelines presented in *Introducing Academic Strategies to Students: A Direct-Instruction Approach*).

Materials:

- Overhead transparencies of short stories or other narrative texts, transparency markers
- Student copies of *Advanced Story Map Worksheet*, and practice narrative passages (optional) or reading/text books

Preparation:

- · Prepare overheads of sample narrative passages.

Steps in Implementing This Intervention:

Step 1: Introduce the concept of a Story Grammar to students and preview main elements. (Refer to the *Advanced Story Map Worksheet* as a guide.) Tell students that a Story Grammar can help them to better understand a story's characters and events.

Step 2: Set aside at least four successive instructional days to introduce the major components of the Story Grammar: (A) Identifying important characters and their personalities and motivation, (B) Identifying main problem and significant plot developments, (C) Noting characters' attempts to

solve problems, and (D) Identifying a narrative's overarching theme.

Interactive Instruction: Make the instruction of each story component highly interactive, with clear teacher demonstration and use of examples. 'Think aloud' as you read through a story with the class to illustrate to students how you arrive at your conclusions. Elicit student discussion about the story. As you fill out sections of the *Advanced Story Map Worksheet* on the overhead, have students write responses on their own copies of the worksheet.

Step 3: Error Correction: When students commit errors, direct them to the appropriate section of the narrative to reread it for the correct answer. Use guiding questions and modeling as necessary to help students to come up with an appropriate response.

Step 4: After students have been introduced to the key Story Grammar elements, the group is now ready to use the Grammar to analyze a sample narrative passage. Have students read independently through a story. Pause at pre-determined points to ask the group key questions (e.g., "Who is the main character? What is she like?"). After discussion, encourage students to write their answers on the *Advanced Story Map Worksheet* while you fill out the same worksheet as an overhead. Give specific praise to students for appropriately identifying Story Grammar elements.

Step 5: When students are able to use the Story Grammar independently, have them read through selected stories and complete the *Advanced Story Map Worksheet* on their own. Check students' responses and conference individually with those students requiring additional guidance and support.

Troubleshooting:

Students do not seem motivated to use the Story Grammar framework. To make a Story Grammar analysis more inviting, consider screening a video of a popular movie or television program. At key points, stop the tape, have students complete relevant sections of the Advanced Story Map Worksheet, and discuss the results. This exercise can be highly motivating and also makes clear to students that a Story Grammar is a universal tool that help us understand narratives presented in any medium.

Some students do not appear to be successful in using the Story Grammar independently. Pull aside individuals or small groups of students who might be having similar problems mastering the Story Grammar. As you read together through a story, have students "think aloud" the strategies that they follow to identify Story Grammar elements. If you discover that a student is using a faulty approach (e.g., rotely selecting the first character named in the story as the main character) you can gently correct the student by modeling and demonstrating more appropriate strategies.

References

Gardill, M.C. & Jitendra, A.K. (1999). Advanced story map instruction: Effects on the reading comprehension of students with learning disabilities. *The Journal of Special Educatio*n, 28, 2-17.

Anticipation Reading Guide *(Duffelmeyer, 1994; Merkley, 1996)*

School-Based Intervention Idea from www.interventioncentral.org

To activate their prior knowledge of a topic, students complete a brief questionnaire on which they must express agreement or disagreement with 'opinion' questions tied to the selection to be read; students then engage in a class discussion of their responses.

The instructor first constructs the questionnaire. Each item on the questionnaire is linked to the content of the article or story that the students will read. All questionnaire items use a 'forced-choice' format in which the student must simply agree or disagree with the item. After students have completed the questionnaire, the teacher reviews responses with the class, allowing students an opportunity to explain their rationale for their answers. Then students read the article or story.

References

Duffelmeyer, F.A. (1994). Effective anticipation guide statements for learning from expository prose. Journal of Reading, 37, 452 - 457.

Merkley, D.J. (1996). Modified anticipation guide. Reading Teacher, 50, 365-368.

Building Comprehension of Textbook Readings Through SQ3R *(Robinson, 1946)*

School-Based Intervention Idea from www.interventioncentral.org

Students grasp a greater amount of content from their textbook readings when they use the highly structured SQ3R ('Survey, Question, Read, Recite, Review') process.

(1) SURVEY: Prior to reading a section of the textbook, the reader surveys the selection by examining charts, tables, or pictures, looking over chapter headings and subheadings, and reading any individual words or blocks of text highlighted by the publisher. (2) QUESTION: In preparation for reading, the reader next generates and writes down a series of key 'questions' about the content based on the material that he or she has surveyed. (3) READ: As the reader reads through the selection, he or she seeks answers to the questions posed. (4) RECITE: After finishing the selection, the reader attempts to recite from memory the answers to the questions posed. If stuck on a question, the reader scans the text to find the answer. (5) REVIEW: At the end of a study session, the reader reviews the list of key questions and again recites the answers. If the reader is unable to recall an answer, he or she goes back to the text to find it.

References

Robinson, F. P. (1946). Effective study. New York: Harper & Row

Conversing With the Writer Through Text Annotation *(Harris, 1990; Sarkisian, Toscano, Tomkins-Tinch, & Casey, 2003)*

School-Based Intervention Idea from www.interventioncentral.org

Students are likely to increase their retention of information when they interact actively with their reading by jotting comments in the margin of the text.

Students are taught to engage in an ongoing 'conversation' with the writer by recording a running series of brief comments in the margins of the text. Students may write annotations to record their opinions of points raised by the writer, questions triggered by the reading, or vocabulary words that the reader does not know and must look up. NOTE: Because this strategy requires that students write in the margins of a book or periodical, text annotation is suitable for courses in which students have either purchased the textbook or have photocopies of the reading available on which to write.

References

Harris, Jane (1990). Text annotation and underlining as metacognitive strategies to improve comprehension and retention of expository text. Paper presented at the Annual Meeting of the National Reading Conference (Miami).

Sarkisian V., Toscano, M., Tomkins-Tinch, K., & Casey, K. (2003). Reading strategies and critical thinking. Retrieved October 15, 2006, from http://www.academic.marist.edu/alcuin/ssk/stratthink.html

Mining Information from the Text Book *(Garner, Hare, Alexander, Haynes, & Vinograd, 1984)*

School-Based Intervention Idea from www.interventioncentral.org

With 'text lookback' the student increases recall of information by skimming previously read material in the text in a structured manner to look that information up.

First, define for the student the difference between 'lookback' and 'think' questions. 'Lookback' questions are those that tell us that the answer can be found right in the article, while 'think' questions are those that ask you to give your own opinion, belief, or ideas. When faced with a lookback question, readers may need to look back in the article to find the information that they need. But readers can save time by first skimming the article to get to the general section where the answer to the question is probably located. To skim efficiently, the student should (1) read the text-lookback question carefully and highlight the section that tells the reader what to look for (e.g., "What does the article say are the FIVE MOST ENDANGERED SPECIES of whales today?"), (2) look for titles, headings, or illustrations in the article that might tell the reader where the information that he or she is looking for is probably located, (3) read the beginning and end sentences in individual paragraphs to see if that paragraph might contain the desired information.

References

Garner, R., Hare, V.C., Alexander, P., Haynes, J., & Vinograd, P. (1984). Inducing use of a text lookback strategy among unsuccessful readers. American Educational Research Journal, 21, 789-798.

Previewing the Chapter *(Gleason, Archer, & Colvin, 2002)*

School-Based Intervention Idea from www.interventioncentral.org

The student who systematically previews the contents of a chapter before reading it increases comprehension--by creating a mental map of its contents, activating prior knowledge about the topic, and actively forming predictions about what he or she is about to read.

In the previewing technique, the student browses the chapter headings and subheadings. The reader also studies any important graphics and looks over review questions at the conclusion of the chapter. Only then does the student begin reading the selection.

References

Gleason, M. M., Archer, A. L., & Colvin, G. (2002). Interventions for improving study skills. In M. A. Shinn, H. M. Walker & G. Stoner (Eds.), Interventions for academic and behavior problems II: Preventive and remedial approaches (pp.651-680). Bethesda, MD: National Association of School Psychologists.

Question-Answer Relationships (QAR) *(Raphael, 1982; Raphael, 1986)*

School-Based Intervention Idea from www.interventioncentral.org

Students are taught to identify 'question-answer relationships', matching the appropriate strategy to comprehension questions based on whether a question is based on fact, requires inferential thinking, or draws upon the reader's own experience.

Students learn that answers to RIGHT THERE questions are fact-based and can be found in a single sentence, often accompanied by 'clue' words that also appear in the question. Students are informed that they will also find answers to THINK AND SEARCH questions in the text--but must piece those answers together by scanning the text and making connections between different pieces of factual information. AUTHOR AND YOU questions require that students take information or opinions that appear in the text and combine them with the reader's own experiences or opinions to formulate an answer. ON MY OWN questions are based on the students' own experiences and do not require knowledge of the text to answer. Students are taught to identify question-answer relationships in class discussion and demonstration. They are then given specific questions and directed to identify the question type and to use the appropriate strategy to answer.

References

Raphael, T. (1982). Question-answering strategies for children. The Reading Teacher, 36, 186-190.

Raphael, T. (1986). Teaching question answer relationships, revisited. The Reading Teacher, 39, 516-522.

Reading Actively *(Gleason, Archer, & Colvin, 2002)*

School-Based Intervention Idea from www.interventioncentral.org

By reading, recalling, and reviewing the contents of every paragraph, the student improves comprehension of the longer passage.

The instructor teaches students to first read through the paragraph, paying particular attention to the topic and important details and facts. The instructor then directs students to cover the paragraph and state (or silently recall) the key details of the passage from memory. Finally, the instructor prompts students to uncover the passage and read it again to see how much of the information in the paragraph the student had been able to accurately recall. This process is repeated with all paragraphs in the passage.

References

Gleason, M. M., Archer, A. L., & Colvin, G. (2002). Interventions for improving study skills. In M. A. Shinn, H. M. Walker & G. Stoner (Eds.), Interventions for academic and behavior problems II: Preventive and remedial approaches (pp.651-680). Bethesda, MD: National Association of School Psychologists.

"Click or Clunk?": A Student Comprehension Self-Check

School-Based Intervention Idea from www.interventioncentral.org

Students periodically check their understanding of sentences, paragraphs, and pages of text as they read. When students encounter problems with vocabulary or comprehension, they use a checklist to apply simple strategies to solve those reading difficulties.

Reserve at least a full instructional session to introduce this comprehension strategy. (For effective-teaching tips, consult the guidelines presented in *Introducing Academic Strategies to Students: A Direct-Instruction Approach*).

Materials:

- Overhead transparencies of practice reading passages and *My Reading Check Sheet*, transparency markers
- Student copies of practice reading passages (optional) or reading/text books, *My Reading Check Sheet*

Preparation:

- Prepare overheads of sample passages.

Steps in Implementing This Intervention:

Step 1: Tell students that they will be learning ways to read more carefully. Hand out student copies of *My Reading Check Sheet*.

Review all of the reading strategies on the student handout.

Instruct students that, during any reading assignment, when they come to:

- the end of each sentence, they should ask the question, "Did I understand this sentence?" If students understand the sentence, they say "Click!" and continue reading. If they do not understand, they say "Clunk!" and refer to the strategy sheet *My Reading Check Sheet* to correct the problem.
- the end of each paragraph, they should ask the question, "What did the paragraph say?" If they do not know the main idea(s) of the paragraph, students refer to the strategy sheet *My Reading Check Sheet* to correct the problem.
- the end of each page, they should ask the question, "What do I remember?" If they do not remember sufficient information, students refer to the strategy sheet *My Reading Check Sheet* to correct the problem.

Read through a sample passage with the class. At the end of each sentence, paragraph, and page, "think aloud" as you model use of the comprehension checks. (As you read each sentence, be sure to call out "Click!" when you and the class understand a sentence and "Clunk!" when you do not.)

Step 2: When students have learned to use the "Click or Clunk?" strategy, have them use it in independent reading assignments.

References

Anderson, T. (1980). Study strategies and adjunct aids. In R. J. Spiro, B. C. Bruce, & W. F. Brewer (Eds.) *Theoretical Issues in Reading Comprehension*, Hillsdale, NJ: Lawrence Erlbaum Associates.

Babbs, P. J. (1984). Monitoring cards help improve comprehension. *The Reading Teacher,* 38(2), 200-204.

Text Lookback

School-Based Intervention Idea from www.interventioncentral.org

Text lookback is a simple strategy that students can use to boost their recall of expository prose by looking back in the text for important information.

Reserve several instructional sessions to introduce the steps in this comprehension strategy. (For effective-teaching tips, consult the guidelines presented in *Introducing Academic Strategies to Students: A Direct-Instruction Approach*).

Materials:

- Overhead transparencies of short (100-200 word) passages from expository text and teacher-prepared text and lookback/think questions, transparency markers
- Student copies of expository text passages and text-lookback /think questions

Preparation:

- Create at least 3 *lookback* questions and one *think* question for each expository text passage selected

Steps in Implementing This Intervention:

Step 1: Introduce the text-lookback strategy by telling students that people cannot always remember everything that they read. If we read an article or book chapter, though, and are asked a 'fact' question about it that we cannot answer, we can always look back in the article to find the information that we need.

Step 2: Describe for the class the difference between lookback and think questions. An example of an explanation that you might use is:

"When we are asked questions about an article, sometimes the answer can be found directly in the article and sometimes it cannot be found directly."

*"*Lookback questions *are those that tell us that the answer can be found right in the article. For example, if a question uses phrases such as in the article or in the author's words, these phrases would be clues that the question is a lookup question and that we can find the answer in the article."*

*"*Think questions *are those that ask you to give your own opinion, beliefs, or ideas. Our answers to these questions are based on our own ideas or thoughts about the topic. For example, if a question uses phrases such as in your opinion or what do you think, these phrases would be clues that the question is a think question and that the answer cannot be found in the article."*

Step 3: Read aloud through the sample expository passage. Then read the series of 4 text-lookback/think questions to the class. As you read each question, highlight for students the word clues that indicate whether the question is a think or text-lookback question.

Step 4: Tell students that they must reread carefully to find the answer to a text-lookback question. However, they can save time by first skimming the article to get to the general section where the answer to the question is probably located. To skim, the student should:

- read the text-lookback question carefully and underline the section that tells the reader what to look for (e.g., "What does the article say are the five most endangered species of whales today?").
- look for titles, headings, or illustrations in the article that might tell the reader where the information that he or she is looking for is probably located
- look at the beginning and end sentences in individual paragraphs to see if that paragraph might contain the desired information.

Step 5: "Thinking aloud", demonstrate for students how to skim the example article to locate efficiently the answer to each text-lookback question.

Step 6: Present additional example articles with text-lookback questions and monitor student mastery of the technique. Assign students to use the strategy independently when, under your supervision, they can distinguish reliably between think and text-lookback questions and are able to find the answers to text-lookback questions in the text.

Reference

Garner, R., Hare, V.C., Alexander, P., Haynes, J., & Vinograd, P. (1984). Inducing use of a text lookback strategy among unsuccessful readers. *American Educational Research Journal*, 21, 789-798.

Keywords: A Memorization Strategy

School-Based Intervention Idea from www.interventioncentral.org

In this mnemonic (memorization) technique, students select the central idea of a passage and summarize it as a 'keyword'. Next, they recode the keyword as a mental picture and use additional mental imagery to relate other important facts to the keyword. They can then recall the keyword when needed, retrieving the related information.

Reserve at least a full instructional session to introduce this comprehension strategy. (For effective-teaching tips, consult the guidelines presented in *Introducing Academic Strategies to Students: A Direct-Instruction Approach*).

Materials:

- Overhead transparencies of sample passages taken from expository texts, transparency markers
- Student copies of *Memorizing Facts: The Keyword Strategy* and practice expository passages (optional) or text books

Preparation:

- Prepare overheads of sample expository passages.
- Review the procedures in the worksheet *Memorizing Facts: The Keyword Strategy*

Steps in Implementing This Intervention:

Step 1: Tell students that a good way to remember lots of facts is to use keywords. With the keyword approach, students:

  - highlight important facts or ideas in a passage

- write a "gist" sentence that summarizes the highlighted ideas or facts
- select a 'keyword' that will help them to recall a central idea about the article or passage.
- create a mental picture to remember the keyword, and then
- add details to the mental picture or create a story around the keyword to memorize additional facts or ideas.

If you have *younger* students (e.g., 5th grade or below), read through several sample passages with the group. Then display a drawing or collage that represents your own representation of the passage's main ideas as mental imagery. Using a "think-aloud" approach, explain the mental imagery of the picture and show how it encapsulates the main facts of the original passage. Show students how they can more easily recall facts using this approach.

If you have *older* students (e.g., 6th grade or above), read through several sample passages with the group. Write a description of the mental imagery that you used to memorize the keyword and related facts. Using a "think-aloud" approach, explain the mental imagery of your keyword and related story and show how the imagery encapsulates the main facts of the original passage. Show students how they can more easily recall facts using this approach.

Step 2: Pair students off and give them a sample passage. Assign each pair of students to:

- identify the main idea of the passage
- write a "gist" sentence to summarize the passage's main idea and related important facts
- select a keyword based on the main idea
- write out a description (or draw a picture) of the mental imagery that they will use to recall the main idea and important facts of the passage.

Step 3: When students are able to use the keyword strategy independently, have them use the technique when reading through expository passages. Monitor students' use of the method and their accuracy in recalling key facts. Conference individually with those students needing additional guidance and support.

References

Levin, J.R., Levin, M.E., Glasman, L.D., & Nordwall, M.B. (1992). Mnemonic vocabulary instruction: Additional effectiveness evidence. Contemporary Educational Psychology, 17, 156-174.

Levin, J.R., Shriberg, L.K., & Berry, J.K. (1983). A concrete strategy for remembering abstract prose. American Educational Research Journal, 20, 277-290.

Peters, E.E. & Levin, J.R. (1986). Effects of a mnemonic imagery on good and poor readers' prose recall. Reading Research Quarterly, 21, 179-192.

Main-Idea Maps

School-Based Intervention Idea from www.interventioncentral.org

This simple strategy teaches students to generate a graphic organizer containing the main ideas of an expository passage.

Reserve at least a full instructional session to introduce this comprehension strategy. (For effective-teaching tips, consult the guidelines presented in *Introducing Academic Strategies to Students: A Direct-Instruction Approach*).

Materials:

- Overhead transparencies of practice expository passages, transparency markers
- Student copies of practice expository passages (optional) or reading/text books, *Main Idea Graphic Organizer* sheet or blank paper

Preparation:

- Prepare overheads of sample passages.

Steps in Implementing This Intervention:

Step 1: Introduce the strategy by telling students that we can draw pictures, or Main Idea Maps, that help us to understand how the ideas of a multi-paragraph passage fit together. Present these three steps for mapping out the main ideas of an expository:

Locating the Main Ideas of Paragraphs. Read through a short (2-6 paragraph) practice expository passage with students.

On a blank overhead transparency or chart paper, begin building a graphic organizer by writing the title of the passage in the center. Draw a box

around the title. (If the passage has no title, query the class and make up a suitable title based on their suggestions.) NOTE: Instead of drawing your own map, you can use the pre-formatted Main Idea Graphic Organizer that is included with this strategy.

Tell students that some paragraphs have summary sentences that state the main idea or "gist" of the paragraph or passage. Other paragraphs have implied main ideas, which the reader must figure out, based on key facts or ideas that they contain.

Go through each paragraph in the practice passage and identify the paragraph's main idea. Demonstrate how to summarize that main idea as a single, succinct phrase.

Building the Main Idea Graphic Organizer. As you summarize each paragraph's main idea, write the number of the paragraph and main-idea summary phrase on the graphic organizer. (Start writing at the upper left corner of the organizer sheet and continue clockwise around the page. Space the summary phrases to allow space to write under each. See the sample "Main Idea Graphic Organizer.").

Adding Key Facts. When you have written the main idea for all of the paragraphs onto the graphic organizer, return to the passage. For each paragraph, pull out 2-3 important facts, ideas, or supporting details. On the graphic organizer, write these key pieces of additional information under the main-idea phrase for that paragraph. Then draw a box around the main-idea and supporting details and move on to the next paragraph.

Step 2: Practice Using the Graphic Organizer as a Study Tool. Demonstrate how the completed Main Idea Graphic Organizer can be a useful method to summarize and review the content of expository passages. Give students new practice passages and have them create their own graphic organizers. Provide feedback and encouragement as needed.

References

Berkowitz, S.J. (1986). Effects of instruction in text organization on sixth-grade students' memory for expository reading. *Reading Research Quarterly*, 21, 161-178.

Mental Imagery: Improving Text Recall

School-Based Intervention Idea from www.interventioncentral.org

By constructing "mental pictures" of what they are reading and closely studying text illustrations, students increase their reading comprehension.

Reserve at least a full instructional session to introduce this comprehension strategy. (For effective-teaching tips, consult the guidelines presented in *Introducing Academic Strategies to Students: A Direct-Instruction Approach*).

Materials:

- Overhead transparencies of sample passages taken from expository or narrative texts, transparency markers
- Student copies of practice expository or narrative passages (optional) or reading/text books

Preparation:

- Prepare overheads of sample expository or narrative passages.

Steps in Implementing This Intervention:

Step 1: Tell students that they can remember more of what they read by:

- making pictures in their mind of what they are reading
- carefully studying pictures or illustrations that appear in their reading or text books

Step 2: Using a "think-aloud" approach, read through a short sample narrative or expository passage. Pause at several points to tell the class what "mental pictures" come to your mind as you read; ask students to describe their own mental imagery as they react to the same passage. As you come across pictures or illustrations in the passage, study them and reflect aloud on what clues they give you about the passage's meaning.

Step 3: Read aloud from additional passages. Stop at key points in the passage and call on students to relate their mental imagery evoked by the passage or to give their interpretation of the significance of illustrations or pictures.

Step 4: When students are able to use mental imagery independently, use a prompt at the start of reading assignments to cue them to use the strategy. You might say, for example, "Now we are going to read about what life is like in a country village in Zimbabwe. Remember to make pictures in your head about what you are reading and study the pictures carefully."

References

Gambrell, L.B. & Bales, R.B. (1986). Mental imagery and the comprehension-monitoring performance of fourth- and fifth-grade poor readers. *Reading Research Quarterly*, 21, 454-464.

Gambrell, L.B. & Jawitz, P.B. (1993). Mental imagery, text illustrations, and children's story comprehension and recall. *Reading Research Quarterly*, 23, 265-273.

Oral Recitation Lesson

School-Based Intervention Idea from www.interventioncentral.org

This intervention builds student motivation and interest by having them participate along with the teacher in repeated public readings of a story across several days. Throughout the process, the entire class discusses the work as literature.

Reserve several instructional sessions to introduce the steps in this comprehension strategy. (For effective-teaching tips, consult the guidelines presented in *Introducing Academic Strategies to Students: A Direct-Instruction Approach*).

Materials:

- Teacher and student copies of reading series or literature books

Preparation:

- Select and become familiar with a story to be read by the class across multiple days.

Steps in Implementing This Intervention:

Step 1: On day 1, introduce the story, giving general information about the characters, setting, and plot. Engage students in a discussion about what they predict might happen in the story.

> Read the entire story aloud to the class while students follow along in their own books. Read in an expressive manner (e.g., using a dramatic voice to emphasize dire or urgent situations, changing inflection and tone of voice to reflect the dialog of various characters, etc.). Stop periodically in your reading to ask reaction questions ("How do you feel about the predicament that Mr. Blaha finds himself in? Has anything

like that ever happened to you?") and prediction questions ("OK, we know that Mr. Blaha is in trouble because he is lost in the cave with no flashlight. What do you think he will do next?").
At the conclusion of the story, discuss its narrative elements with the class. For example, you might ask students to:

- describe the personality of the main character
- talk about other important characters in the story and their foibles or qualities
- give details about the time and setting of the story
- pinpoint the central problem(s) or challenge(s) that the main character faces
- describe how the main character responded to various plot developments
- decide what overarching theme or lesson the story might convey.

Wrap up the lesson by summarizing the story. Be sure to fold into your summary key points that came up in class discussion. Use this opportunity to highlight and define new vocabulary that appeared in the story.

Step 2: On day 2, give a thumbnail review of the story that you read to the class on Day 1.

Inform students that in this session they will have the chance to practice reading the story aloud. Their goal is to read selections from the story with fluency, and feeling.

Read an opening passage from the story. As you read, stop occasionally to point out to students how you use expressive qualities of your voice to make the story "come alive."

Read another short passage. Then direct the entire class to read the same passage aloud. Next, select a single student to read the passage, directing him or her to use an expressive voice. If the student reader has difficulty, model by reading the passage aloud again. At the end of the student's reading, gently correct any reading mistakes that interfere with the story's meaning and praise the student. Ask other students to read additional passages aloud as time allows.

Assign each student in the class a short passage from the story that they will be responsible for reading aloud at the next session. (Day 3). Allow them time to practice their passage (or assign as homework).

Step 3: On day 3, read an introductory passage from the story aloud, again with expression. As you come to a passage assigned to a student, ask that student to read his or her section aloud. Provide supportive feedback to the student about his or her performance and ask other students to comment on the reading as well. Continue through the story until all students have read their assigned selections.

References

Hoffman, J.R. (1987). Rethinking the role of oral reading in basal instruction. *The Elementary School Journal*, 87, 367-373.

Reutzel, D.R. & Hollingsworth, P.M. (1993). Effects of fluency training on second graders' reading comprehension. *Journal of Educational Research*, 86, 325-331.

Prior Knowledge: Activating the 'Known'

School-Based Intervention Idea from www.interventioncentral.org

Through a series of guided questions, the instructor helps students activate their prior knowledge of a specific topic to help them comprehend the content of a story or article on the same topic. Linking new facts to prior knowledge increases a student's inferential comprehension (ability to place novel information in a meaningful context by comparing it to already-learned information).

Reserve at least a full instructional session to introduce this comprehension strategy. (For effective-teaching tips, consult the guidelines presented in *Introducing Academic Strategies to Students: A Direct-Instruction Approach*).

Materials:

- Overhead transparencies of practice reading passages and sample Text Prediction questions, transparency markers
- Student copies of practice reading passages (optional) or reading/text books, blank paper and pencil or pen

Preparation:

- Prepare overheads of sample passages.
- Locate 3 main ideas per passage and-for each idea-develop a prior knowledge question and a prediction question (see below).

Steps in Implementing This Intervention:

Step 1: Introduce this strategy to the class:

Explain the Benefit of Using Prior Knowledge to Understand a Reading Passage: Tell students that recalling their prior experiences ("their own life") can help them to understand the content of their reading. New facts make sense only when we connect them to what we already know.

Demonstrate the Text Prediction Strategy. Select a sample passage and use a "think-aloud" approach to show students how to use the text-prediction strategy. (Note: To illustrate how the strategy is used, this intervention script uses the attached example,*Attending Public School in Japan*.)

Prompt Students to Think About 'What and Why': Describe what strategy you are about to apply and the reason for doing so. You might say, for example, "I am about to read a short article on public schools in Japan. Before I read the article, though, I should think about my life experiences and what they might tell me about the topic that I am about to read about. By thinking about my own life, I will better understand the article."

Preview Main Ideas from the Reading and Pose Prior Knowledge and Prediction Questions. One at a time, pose three main ideas that appear in the article or story. For each key idea, present one question requiring that readers tap their own prior knowledge of the topic and another that prompts them to predict how the article or story might deal with the topic.

Here is a typical question cycle, composed of a main idea statement, prior knowledge question, prediction question, and student opportunity to write a response.

- "The article that we are going to read describes how different the writing system used in Japanese schools is from our own writing system" [A main idea from the passage].
- "What are your own attitudes and experiences about writing?" [prior knowledge question] Answer this question aloud, and then encourage students to respond.
- "What do you think that the article will say about the Japanese writing system?" [prediction question] Answer this question aloud, and then seek student responses.
- "Now, write down your own ideas about what you think the article will say about the Japanese writing system." [student written response] As students write their own responses, model for them by writing out your answer to the question on the overhead transparency.

Assign Students to Read the Story or Article Independently. Once you have presented three main ideas and students have responded to all questions, have them read the selection independently.

Step 2: When students have learned the Text Prediction strategy, use it regularly to introduce new reading assignments.

References

Hansen, J. & Pearson, P.D. (1983). An instructional study: Improving the inferential comprehension of good and poor fourth-grade readers. *Journal of Educational Psychology*, 75, 821-829.

Question-Generation

School-Based Intervention Idea from www.interventioncentral.org

Students are taught to boost their comprehension of expository passages by (1) locating the main idea or key ideas in the passage and (2) generating questions based on that information.

Reserve at least a full instructional session to introduce this comprehension strategy. (For effective-teaching tips, consult the guidelines presented in *Introducing Academic Strategies to Students: A Direct-Instruction Approach*).

Materials:

- Overhead transparencies of practice reading passages, transparency markers
- Student copies of practice reading passages (optional) or reading/text books

Preparation:

- Prepare overheads of sample passages.

Steps in Implementing This Intervention:

Step 1: Introduce this strategy to the class:

- **Locating Explicit Main Idea:** Tell students that some passages have summary sentences that state the main idea or "gist" of the paragraph or passage. Using examples of passages with explicit main ideas, train students to identify and underline main-idea sentences.
- **Finding Key Facts.** In some passages, the main idea is implied rather than explicitly stated. Readers must first identify the key facts or ideas of the passage before they can summarize the passage's main idea. Using examples of passages with implied main ideas, locate and circle key facts or ideas. Describe to students how you distinguished this central information from less important details. Have students practice this skill on additional practice passages.
- **Writing a "Gist" Sentence.** Show students a passage with an implied main idea. Circle all key ideas or facts. Demonstrate how to write a "gist" sentence (one that is built from the identified key ideas and summarizes the paragraph's main idea). Emphasize that the reader may have link information from different sections of the passage to build a gist sentence. Have students practice this skill on additional practice passages.
- **Generating Questions.** Tell students that careful readers often construct questions about what they are reading to help them learn. Put up a list of 'signal words' that can be used as question-starters: e.g., who, what, where, when, why, how. Using sample passages, show students how to convert explicit main-idea sentences or reader-created "gist" sentences into questions. Point out that these questions can be a good study tool because they are linked to answers that the student has already located in the passage.

Step 2: Give students selected practice passages and instruct them to apply the full question-generation strategy. Provide feedback and encouragement as needed.

References

Davey, B., & McBride, S. (1986). Effects of question-generation training on reading comprehension. *Journal of Educational Psychology*, 78, 256-262.

Rosenshine, B., Meister, C., & Chapman, S. (1996). Teaching students to generate questions: A review of the intervention studies. *Review of Educational Research*, 66, 181-221.

Reciprocal Teaching: A Reading Comprehension Package

School-Based Intervention Idea from www.interventioncentral.org

The intervention package teaches students to use reading comprehension strategies independently, including text prediction, summarization, question generation, and clarification of unknown or unclear content.

For effective-teaching tips to use when introducing this strategy, consult the guidelines presented in *Introducing Academic Strategies to Students: A Direct-Instruction Approach*.

Materials:

- Overhead transparencies of practice reading passages, transparency markers
- Student copies of *Be a Careful Reader!: Four Strategies to Better Understand What You Are Reading*, *Reciprocal Teaching Strategies Worksheet*, and practice reading passages (optional) or reading/text books

Preparation:

- · Prepare overheads of sample passages.

Steps in Implementing This Intervention:

Step 1: Set aside at least *four* successive instructional days to introduce students to each of the following comprehension strategies:

- Day 1: Prediction,
- Day 2: Summarization ("list main ideas"),
- Day 3: Question Generation,
- Day 4: Clarifying.

As you introduce each strategy, "think aloud" as you apply the technique to a sample passage, write down responses on the *Reciprocal Teaching Strategies Worksheet*, and check for student understanding of key concepts. (NOTE: See the student handout, *Be a Careful Reader!: Four Strategies to Better Understand What You Are Reading*, for a review of the core concepts of Reciprocal Teaching.)

Step 2: After students have been introduced to the key strategies, the group is now ready to apply all four strategies from the *Reciprocal Teaching* package to a sample reading passage. For each strategy (prediction, summarization, question generation, clarifying), briefly review the technique. Then randomly select a student "instructor" to guide the group to apply the strategy and complete the relevant section of the *Reciprocal Teaching Strategies Worksheet*. (Be prepared to offer assistance to the student "instructor" as needed.) Give specific praise to students for appropriately using comprehension strategies.

Step 3: As the group shows an increased mastery of the strategies, assign students to read text segments silently. Then take the students as a group through the four strategies, calling on different students to discuss how they applied the strategies to the passage.

Step 4: Give students copies of the *Reciprocal Teaching Strategies Worksheet* and instruct them to read a passage silently without interruption. Prior to their starting, remind students to take time occasionally during reading to make predictions about the text, note main ideas, formulate key questions, and clarify unclear material.

Troubleshooting:

While they participate in the large-group instruction, some students do not appear to use the comprehension strategies in their independent reading. After independent reading assignments, pair students off to compare their completed Reciprocal Teaching worksheets. Have individuals in each student pair alternate in discussing how they applied the strategies. Walk around the room observing discussion. If you notice that a student has failed to complete his or her worksheet, pull him or her aside later for a private conference to discover what problems might be preventing the student from using these strategies.

Students do not use the Reciprocal Teaching strategies *across* instructional settings. Let other teachers know that you have taught your students to use this package of comprehension strategies. Share copies of the Reciprocal Teaching Strategies Worksheet with your fellow instructors and invite them to use it. Share a copy of the worksheet with students' parents and encourage them to see that their child uses it for all reading assignments.

References

Lysynchuk, L.M., Pressley, M., & Vye, N.J. (1990). Reciprocal teaching improves standardized reading comprehension performance in poor comprehenders. *The Elementary School Journal*, 90, 469-484.

Listening, Reading, And Receiving Corrective Feedback *(Rose & Sherry, 1984; Van Bon, Boksebeld, Font Freide, & Van den Hurk, J.M., 1991)*

School-Based Intervention Idea from www.interventioncentral.org

The student 'rehearses' a text by first following along silently as a more accomplished reader (tutor) reads a passage aloud; then the student reads the same passage aloud while receiving corrective feedback as needed.

The student and tutor sit side-by-side at a table with a book between them. The tutor begins by reading aloud from the book for about 2 minutes while the student reads silently. If necessary, the tutor tracks his or her progress across the page with an index finger to help the student to keep up. At the end of the 2 minutes, the tutor stops reading and asks the student to read aloud. If the student commits a reading error or hesitates for longer than 3-5 seconds, the tutor tells the student the correct word and has the student continue reading. For each new passage, the tutor first reads the passage aloud before having the student read aloud.

References

Rose, T.L., & Sherry, L. (1984). Relative effects of two previewing procedures on LD adolescents' oral reading performance. Learning Disabilities Quarterly, 7, 39-44.

Van Bon, W.H.J., Boksebeld, L.M., Font Freide, T.A.M., & Van den Hurk, J.M. (1991). A comparison of three methods of reading-while-listening. Journal of Learning Disabilities, 24, 471-476.

Paired Reading *(Topping, 1987)*

School-Based Intervention Idea from www.interventioncentral.org

The student builds fluency and confidence as a reader by first reading aloud in unison with an accomplished reader, then signaling that he or she is ready to read on alone with corrective feedback.

The more accomplished reader (tutor) and student sit in a quiet location with a book positioned between them. The tutor says to the student, "Now we are going to read aloud together for a little while. Whenever you want to read alone, just tap the back of my hand like this [demonstrate] and I will

stop reading. If you come to a word you don't know, I will tell you the word and begin reading with you again." Tutor and student begin reading aloud together. If the student misreads a word, the tutor points to the word and pronounces it. Then the student repeats the word. When the student reads the word correctly, tutor and student resume reading through the passage. When the child delivers the appropriate signal (a hand tap) to read independently, the tutor stops reading aloud and instead follows along silently as the student continues with oral reading. The tutor occasionally praises the student in specific terms for good reading (e.g., "That was a hard word. You did a nice job sounding it out!"). If, while reading alone, the child either commits a reading error or hesitates for longer than 5 seconds, the tutor points to the error-word and pronounces it. Then the tutor tells the student to say the word. When the student pronounces the error-word correctly, tutor and student resume reading aloud in unison. This tandem reading continues until the student again signals to read alone.

References

Topping, K. (1987). Paired reading: A powerful technique for parent use. Reading Teacher, 40, 608-614.

Repeated Reading *(Herman, 1985; Rashotte & Torgesen, 1985; Rasinski, 1990)*

School-Based Intervention Idea from www.interventioncentral.org

The student increases fluency in decoding by repeatedly reading the same passage while receiving help with reading errors.

A more accomplished reader (tutor) sits with the student in a quiet location with a book positioned between them. The tutor selects a passage in the book of about 100 to 200 words in length. The tutor directs the student to read the passage aloud. If the student misreads a word or hesitates for longer than 5 seconds, the tutor reads the word aloud and has the student repeat the word correctly before continuing through the passage. If the student asks for help with any word, the tutor reads the word aloud. If the student requests a word definition, the tutor gives the definition. When the student has completed the passage, the tutor directs the student to read the passage again. The tutor directs the student to continue rereading the same passage until either the student has read the passage a total of 4 times or the student reads the passage at the rate of at least 85 to 100 words per minute. Then tutor and student select a new passage and repeat the process.

References

Herman, P.A. (1985). The effects of repeated readings on reading rate, speech pauses, and word recognition accuracy. Reading Research Quarterly, 20, 553-565.

Rashotte, C.A. & Torgesen, J.K. (1985). Repeated reading and reading fluency in learning disabled children. Reading Research Quarterly, 20, 180-188.

Rasinski, T.V. (1990). Effects of repeated reading and listening-while-reading on reading fluency. Journal of Educational Research, 83(3), 147-150.

Assisted Reading Practice

School-Based Intervention Idea from www.interventioncentral.org

In this very simple but effective intervention, the student reads aloud while an accomplished reader follows along silently. If the student commits a reading error, the helping reader corrects the student error.

Materials:

- Reading book

Preparation:

- The teacher, parent, adult tutor, or peer tutor working with the student should be trained in advance to use assisted reading approach.

Steps in Implementing This Intervention:

Step 1: Sit with the student in a quiet location without too many distractions. Position the book selected for the reading session so that both you and the student can easily follow the text. (Or get two copies of the book so that you each have your own copy.)

Step 2: Instruct the student to begin reading out loud. Encourage him or her to "do your best reading."

Step 3: Follow along silently in the text as the student reads.

Step 4: If the student mispronounces a word or hesitates for longer than 5 seconds, tell the student the word. Have the student repeat the word correctly. Direct the student to continue reading aloud through the passage.

Step 5: Occasionally, praise the student in specific terms for good reading (e.g., "You are doing a really great job of sounding out the words that you don't know. Good work!").

References

Shany, M.T. & Biemiller, A. (1995). Assisted reading practice: Effects on performance for poor readers in grades 3 and 4 . *Reading Research Quarterly*, 30, 382-395.

Kids as Reading Helpers: A Peer Tutor Training Manual

School-Based Intervention Idea from www.interventioncentral.org

Perhaps the most pressing challenge that schools face is that of ensuring that all children become competent readers. Young children who experience problems in reading quickly fall behind their more skilled classmates in their ability to decode and comprehend text. This gap in reading skills can emerge as early as first grade-and, once present, tends to be quite stable over time (Stanovich, 1986). First-grade teachers can predict with some confidence, for example, that those children in their classrooms with significant reading deficits by the end of the school year will very likely have continuing difficulties in reading in the fourth grade.

While the long-term negative impact of poor readers can be enormous, the good news is that schools can train their own students to deliver effective tutoring in reading to younger peers. *Kids as Reading Helpers: A Peer Tutor Training Manual* is a complete package for training peer reading tutors. Peer tutoring answers the nagging problem of delivering effective reading support to the many struggling young readers in our schools. Furthermore, peer tutoring programs can improve the reading skills of tutors as well as tutees (Ehly, 1986) and - in some studies-have been shown to build tutor's social skills as well (Garcia-Vazquez & Ehly, 1995). Young children tend to find the opportunity to read aloud to an older peer tutor to be quite reinforcing, adding a motivational component to this intervention.

Elements of an Effective Peer Tutoring Program

While schools can exercise considerable creative freedom as they put together a peer tutoring program in reading, they should also take care to adhere to a core set of tutoring guidelines to ensure success (Garcia-Vazquez & Ehly, 1995). These guidelines include:

- *selecting peer tutoring activities that supplement classroom instruction.* Peer tutors are not reading teachers, so they do not teach new reading skills. However, peer tutors are ideal for the role of 'reading helpers', who motivate and encourage struggling readers to practice reading skills that were previously taught. Just as important, the tutor can give immediate corrective feedback whenever the child being tutored makes a reading error.
- *providing thorough training to peer tutors in the essential elements of the tutoring process.* Peer tutors cannot carry out the key components of their tutoring assignment unless they have been carefully trained beforehand. Schools organizing a peer tutor training should assume that tutors require lessons in behavioral expectations (e.g., how to move politely and respectfully through the hallway to and from tutoring sessions), use of praise (e.g., congratulating the tutee on having read a difficult passage), and simple academic intervention strategies (e.g., paired reading).
- *ensuring that peer tutors have mastered the essentials of tutoring before allowing them to meet with their tutees.* When training tutors, schools should give them opportunities to practice, and to demonstrate their mastery of, the various skills taught. Trainers can exercise their imaginations to come up with fun ways that tutors can practice skills under the watchful eye of the trainer. Group responding, pairing off students to complete cooperative learning activities, and use of role-play are only some of the strategies that students can be invited to 'show what they know'.
- *adopting research-based treatments to improve the reading skills of tutees.*Peer tutors can be especially useful in helping their tutees to develop fluency in reading. The peer-tutoring program outlined in this manual trains tutors to use either paired reading (Topping, 1987) or 'listening while reading'. Both approaches are simple rehearsal techniques with corrective feedback that have been shown to increase reading fluency.

  The importance of reading fluency to literacy skills was underscored in the recent report issued by the National Reading Panel (2000). In a comprehensive review of effective techniques for teaching students to read, the NRP concluded that "classroom practices that encourage repeated oral reading with feedback and guidance leads to meaningful improvements in reading expertise for students-for good readers as well as those who are experiencing difficulties (NRP, 2000, p.3-3).
- *conducting periodic 'tutoring integrity checks'.* The active treatment components of most peer tutoring programs consist of (1) activities that give the tutee lots of opportunities to practice targeted academic skills. (2) praise, and (3) the timely use of corrective feedback. Adults who supervise peer tutors should occasionally drop in to observe tutoring session, using a structured 'integrity checklist' to rate the quality of the tutoring. These periodic integrity checks can inform the supervisor of any tutors who are lapsing from the prescribed tutoring format and need additional 'refresher' training to improve their tutoring skills.
- *monitoring the effectiveness of peer tutoring.* The purpose of peer tutoring is to improve the reading skills of tutees and tutors alike. Schools should select academic measures to use to track students' reading levels both before tutoring begins (baseline) and during the tutoring program

(ongoing progress monitoring). An ideal, research-based method for tracking student growth in reading fluency is Curriculum-Based Measurement (CBM). CBM is an ideal measure for peer tutoring programs and can be used to monitor reading growth in both tutors and tutees. For a free online manual with guidelines on how to use CBM, view *Curriculum-Based Measurement: A Manual for Teachers* (Wright, 1992).

References

Ehly, S. (1986). *Peer Tutoring: A guide for school psychologists*. Washington, DC: National Association of School Psychologists.

Garcia-Vazquez, E., & Ehly, S. (1995). Best practices in facilitating peer tutoring programs. In A. Thomas & J.Grimes (Eds.), *Best Practices in School Psychology-III* (pp.403-411). Washington, DC: National Association of School Psychologists.

Stanovich, K.E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, *21*, 360-407.

Topping, K. (1987). Paired reading: A powerful technique for parent use. *Reading Teacher*, *40*, 608-614.

Wright, J. (1992). *Curriculum-based measurement: A manual for teachers.* Available online at: *http://www.jimwrightonline.com/pdfdocs/cbmManual.pdf*

Listening Passage Preview

School-Based Intervention Idea from www.interventioncentral.org

The student follows along silently as an accomplished reader reads a passage aloud. Then the student reads the passage aloud, receiving corrective feedback as needed.

Materials:

- Reading book

Preparation:

- The teacher, parent, adult tutor, or peer tutor working with the student should be trained in advance to use the listening passage preview approach.

Steps in Implementing This Intervention:

Step 1: Sit with the student in a quiet location without too many distractions. Position the book selected for the reading session so that both you and the student can easily follow the text. (Or get two copies of the book so that you each have your own copy.)

Step 2: Say to the student, *"Now we are going to read together. Each time, I will read first, while you follow along silently in the book. Then you read the same part out loud."*

Step 3: Read aloud from the book for about 2 minutes while the student reads silently. If you are working with a younger or less-skilled reader, you may want to track your progress across the page with your index finger to help the student to keep up with you.

Step 4: Stop reading and say to the student, *"Now it is your turn to read. If you come to a word that you do not know, I will help you with it."* Have the student read aloud. If the student commits a reading error or hesitates for longer than 3-5 seconds, tell the student the correct word and have the student continue reading.

Step 5: Repeat steps 3 and 4 until you have finished the selected passage or story.

References

Rose, T.L., & Sherry, L. (1984). Relative effects of two previewing procedures on LD adolescents' oral reading performance. *Learning Disabilities Quarterly*, 7, 39-44.

Van Bon, W.H.J., Boksebeld, L.M., Font Freide, T.A.M., & Van den Hurk, J.M. (1991). A comparison of three methods of reading-while-listening. *Journal of Learning Disabilities*, 24, 471-476.

Drilling Error Words *(Jenkins & Larson, 1979)*

School-Based Intervention Idea from www.interventioncentral.org

When students practice, drill, and receive corrective feedback on words that they misread, they can rapidly improve their vocabulary and achieve gains in reading fluency.

Here are steps that the teacher or tutor will follow in the Error Word Drill: (1) When the student misreads a word during a reading session, write down the error word and date in a separate "Error Word Log". (2) At the end of the reading session, write out all error words from the reading session onto index cards. (If the student has misread more than 20 different words during the session, use just the first 20 words from your error-word list. If the student has misread fewer than 20 words, consult your "Error Word Log" and select enough additional error words from past sessions to build the review list to 20 words.) (3) Review the index cards with the student. Whenever the student pronounces a word correctly, remove that card from the deck and set it aside. (A word is considered correct if it is read correctly within 5 seconds. Self-corrected words are counted as correct if they are made within the 5-second period. Words read correctly after the 5-second period expires are counted as incorrect.) (4) When the student misses a word, pronounce the word for the student and have the student repeat the word. Then say, "What word?" and direct the student to repeat the word once more. Place the card with the missed word at the bottom of the deck. (5) Error words in deck are presented until all have been read correctly. All word cards are then gathered together, reshuffled, and presented again to the student. The drill continues until either time runs out or the student has progressed through the deck without an error on two consecutive cards.

References

Jenkins, J. & Larsen, D. (1979). Evaluation of error-correction procedures for oral reading. Journal of Special Education, 13, 145-156.

Tackling Multi-Syllabic Words *(Gleason, Archer, & Colvin, 2002)*

School-Based Intervention Idea from www.interventioncentral.org

The student uses affixes (suffixes and prefixes) and decodable 'chunks' to decode multi-syllabic words.

The instructor teaches students to identify the most common prefixes and suffixes present in multi-syllable words, and trains students to readily locate and circle these affixes. The instructor also trains students to segment the remainder of unknown words into chunks, stressing that readers do not need to divide these words into dictionary-perfect syllables. Rather, readers informally break up the word into graphemes (any grouping of letters including one or more vowels that represents a basic sound unit—or grapheme--in English). Readers then decode the mystery word by reading all affixes and graphemes in the order that they appear in that word.

References

Gleason, M. M., Archer, A. L., & Colvin, G. (2002). Interventions for improving study skills. In M. A. Shinn, H. M. Walker & G. Stoner (Eds.), Interventions for academic and behavior problems II: Preventive and remedial approaches (pp.651-680). Bethesda, MD: National Association of School Psychologists.

Teach a Hierarchy of Strategies *(Haring, Lovitt, Eaton & Hansen, 1978)*

School-Based Intervention Idea from www.interventioncentral.org

The student has a much greater chance of successfully decoding a difficult word when he or she uses a 'Word Attack Hierarchy'--a coordinated set of strategies that move from simple to more complex.

The student uses successive strategies until solving the word. (1) When the student realizes that he or she has misread a word, the student first attempts to decode the word again. (2) Next, the student reads the entire sentence, using the context of that sentence to try to figure out the word's meaning--and pronunciation. (3) The student breaks the word into parts, pronouncing each one. (4) If still unsuccessful, the student uses an index card to cover sections of the word, each time pronouncing only the part that is visible. The student asks 'What sound does ___ make?, using phonics information to sound out the word. (5) If still unsuccessful, the student asks a more accomplished reader to read the word.

References

Haring, N.G., Lovitt, T.C., Eaton, M.D., & Hansen, C.L. (1978). The fourth R: Research in the classroom. Columbus, OH: Charles E. Merrill Publishing.

SMART - Start Making a Reader Today

(Volunteer tutoring program for at-risk readers in early elementary school)

Randomized controlled trial shows that this low-cost intervention has sizable positive impacts on students' reading ability.

Description of the intervention: Developed in 1992 in Oregon, SMART (Start Making a Reader Today) recruits community volunteers to tutor low-performing K-2 students in reading. The program operates statewide, serving approximately 11,000 students in 260 elementary schools each year. The Oregon business community provides significant financial assistance to the program, and many of the volunteer tutors are recruited from the business community.

Volunteers receive minimal training (1-2 hour orientation and introduction to reading strategies), and are encouraged to use their own judgment when tutoring. The program also provides volunteers with a handbook describing four reading strategies a volunteer can use with the student: 1) reading to the student; 2) reading along with the student; 3) reading a passage and having the student re-read it; and 4) asking the child questions during reading.

Teachers identify students at-risk of reading failure to participate in the program. These students attend 30-minute sessions twice a week during school hours, and can take home two books per month to build a home library.

Each school has a part-time SMART coordinator with no formal training in elementary reading instruction who manages the logistics of the program. In the version of SMART that was rigorously evaluated, each student participated in tutoring for six months in both first and second (but not third) grade.

The program, which has primarily been paid for by donations, costs $300 per child per year (2004 dollars), making it a very low-cost intervention.

Click here for the SMART website.

Reference:

Baker, Scott, Russell Gersten and Thomas Keating. When less may be more: A 2-year longitudinal evaluation of a volunteer tutoring program requiring minimal training. *Reading Research Quarterly,* Volume 35, Number 4; Oct-Dec. 2000.

PALS (Peer Assisted Learning Strategies)

Peer Assisted Learning Strategies (PALS) is a class-wide peer-tutoring program providing supplemental practice and instruction on key reading skills. K-PALS focuses on phonemic awareness, alphabetic principle and sight word reading. First Grade PALS focuses on alphabetic principle, fluency and sight word reading. Second-Eighth Grade PALS focuses on fluency and accuracy in connected text and reading comprehension strategies of summarization, main idea and predication. High School PALS focuses on Fluency and comprehension skills within the context of a career, job oriented structure. Lessons are provided to train students to be "readers and coaches." Students are taught correction procedures and instructional cues. K=8 PALS can be used in general or special educational classrooms.
High School PALS has only been validated in special education and remedial settings.

Program: PALS (Peer Assisted Learning Strategies)

Publisher/Source: Vanderbilt University

Educational level: K, 1, 2-6, 7-12

Author: Lynn and Doug Fuchs

QuickReads

QuickReads is a research-based fluency program that features short, high interest nonfiction texts designed to be read quickly and meaningfully. It is designed for students who read at grade levels 2 – 4. QuickReads can improve fluency, comprehension, background knowledge and vocabulary.

QuickReads has a classroom-validated instructional routine that takes 15 minutes and is done with students daily. QuickReads promotes fluent reading by:

1. Supporting automaticity through the use of grade level, high frequency words and phonics/syllabic patterns necessary for success at each grade level.
2. Developing content-rich vocabulary, consistent comprehension strategies and critical background knowledge.

3. Helping students learn more about critical curriculum areas with a focus on social studies and science.
4. Helping students build background knowledge by reading five connected text passages around one topic.
5. Modeling fluent reading by teacher model.
Evidence of Positive Effects on Reading Achievement: Field-testing in classrooms demonstrated significant fluency gains for both native English speakers as well as English language learners. For additional information see website: www.textproject.org.

Local evidence of positive effects: Local School districts within Heartland have data available on fluency gains of students.
Program: QuickReads
Source/Publisher: Pearson Learning
Educational Level: 2nd – 4th grade and remedial 5th – 7th
Educational Level: 2nd – 4th grade and remedial 5th – 7th
Author: Alfrieda Hiebart

REWARDS (Reading Excellence: Word Attack and Rate Development Strategies)

The REWARDS method is a flexible strategy to move students from early elementary reading level to one of increased fluency and comprehension. Many student having mastered basic readings skills have difficulty with multisyllabic words. The REWARDS method of decoding words by segmenting their parts is key to this program. It has been field tested with positive results in intensive remedial programs as well as in general and special education classrooms.

Program: REWARDS (Reading Excellence: Word Attack and Rate Development Strate3gies)
Publisher/Source: Sopris West
Education level: Grades 3-7
Author: Anita Archer

Tutoring with the Lindamood Phonemic Sequencing Reading Curriculum

(An intervention for at-risk readers in grades K-2)

Randomized controlled trial shows sizable positive impacts on reading ability for students with poor phonological processing (e.g., letter naming, and awareness of the sounds within words).

Description of the intervention: Lindamood Phonemic Sequencing is a curriculum for K-2 students with poor phonological processing. The curriculum provides intense instruction in word-level skills -- including building awareness of the sounds within words ("phonemic awareness") and letter-sound correspondences -- to enable students to "decode" individual words. After the children demonstrate mastery in decoding words, they begin reading text that is readily decodable, followed by oral reading of regular books with tutors focusing on comprehension skills.

In the version of this intervention that was rigorously evaluated, students were provided one-on-one tutoring using Lindamood Phonemic Sequencing, in four 20-minute sessions per week for 2.5 years beginning in the second semester of kindergarten. Two of the sessions were conducted by a certified reading teacher and two by a teacher's aide who followed the teacher's written instructions. The teachers received 18 hours of training prior to the intervention, and three hours of in-service training bi-weekly during the intervention. Their tutoring sessions were periodically videotaped and reviewed by project consultants to identify areas for improvement. The aides were provided less extensive training.

The cost of the Lindamood Phonemic Sequencing manual and initial 18-hour training is $649 per teacher. Additional costs include (i) the teachers' time spent tutoring (about one hour per student per week); (ii) the aides' time tutoring (also an hour per student per week); (iii) the bi-weekly in-service training of teachers; and (iv) the training of aides.

Click here for the curriculum's website.

Source

Torgesen, Joseph, Richard Wagner, Carol Rashotte, Elaine Rose, Patricia Lindamood, Tim Conway, & Cyndi Garvan (1999). "Preventing reading failure in young children with phonological processing disabilities: Group and individual responses to instruction." *Journal of Educational Psychology, 91, 579-593.*

Teaching Phonemic Awareness: Phonemic Awareness programs and materials

Phonemic Awareness materials should:

1. Progress from easier phonemic awareness activities to more difficult (rhyming, sound matching to blending, segmentation, and manipulation).
2. Focus on segmentation or the combination of blending and segmenting.
3. Start with larger linguistic units (i.e., words and syllables) and proceed to smaller linguistic units (i.e., phonemes).
4. Begin instruction that focuses on the phonemic level of phonological units with short words (2-3 phonemes: **at, mud, run**).
5. Focus first on initial (sat), then final (sat), and lastly the medial sound (sat) in word).
6. Introduce continuous sounds (e.g., **m, r, s**) before stop sounds (**t, b, k**), as stop sounds are more difficult to elongate and isolate.
7. Add letter-sound correspondence instruction to phonological awareness interventions after children demonstrate early phonemic awareness.
8. Provide brief instructional sessions. Significant gains in phonemic awareness are often made in 15-20 minutes of daily instruction and practice over a period of 9-12 weeks.

Source

Smith S. B., Simmons, D. C., & Kame'enui, E. J. (1998). Phonological awareness: Instructional and curricular basics and implications. In D. C. Simmons & E. J. Kame'enui (eds.), What reading research tells us about children with diverse learning needs: Bases and basics. Mahwah, NJ: Lawrence Erlbaum Associates.

The Lindamood Phoneme Sequencing® Program

A program that stimulates phonemic awareness. Individuals become aware of the mouth actions which produce speech sounds. This awareness becomes the means of verifying sounds within words and enables individuals to become self-correcting in reading and spelling, and speech.

It is common for individuals to gain several grade levels in decoding ability in four weeks to six weeks of intensive instruction, or to make further gains in speech-language after hitting a plateau under traditional speech therapy.

Source

Pokorni, Judith L.; Worthington, Colleen K.; Jamison, Patricia J. (2004). Phonological Awareness Intervention: Comparison of Fast Forword, Earobics, and Lips. *Journal of Educational Research*, *97*, 3. 147-158.

Strategies for Phonemic/Phonological Awareness Instruction

When the reader's problem is:

inability to recognize or produce rhyming words, hear number of words in a sentence, or hear word parts	**difficulty isolating phonemes, blending phonemes to make words, segmenting words into phonemes, or manipulating sounds in words**	**at-risk second grade or older student who doesn't spell well, or makes frequent errors on sounds during oral reading, doesn't seem to "get" phonics**
Strategies • use predictable books with rhyme patterns • nursery rhymes and songs • generate rhyming words • clap words in oral sentence • begin with compound	**Strategies** • model phonemic task • use picture sorts • Elkonin Boxes • manipulatives or physical movement • use word building • use word chaining	**Strategies** • making words • word chaining with complex sound spelling patterns including blends, digraphs and vowel teams • Phoneme Grapheme

words and move to two or more syllable words • clap word parts in names and names of objects • engage in word play	• use arrow or signal to blend	Mapping • practice oral manipulation of sounds
Resources • *Rode to the Code* • Harcourt lessons • Scholastic Phonemic Awareness Kit • *Sounds in Action* (Zgonc) • *Phonemic Awareness in Young Children* (Adams)	**Resources** • *Rode to the Code* • Harcourt lessons • Scholastic Phonemic Awareness Kit • *Sounds in Action* (Zgonc) • *Phonemic Awareness in Young Children* (Adams)	**Resources** • *Sound and Letters for Readers and Spellers* • ABeCeDarian Reading Plan • Phonographix

Obtained from http://www.educationoasis.com/curriculum/Reading/Resources_reading/ISphonolog.htm on 12/8/2008.

Encourage Students to Draw to Clarify Understanding *(Van Essen & Hamaker, 1990)*

Description: Making a drawing of an applied, or 'word', problem is one easy heuristic tool that students can use to help them to find the solution. An additional benefit of the drawing strategy is that it can reveal to the teacher any student misunderstandings about how to set up or solve the word problem.

Materials: Math worksheet containing at least six word problems.

Reference: Van Essen, G., & Hamaker, C. (1990). Using self-generated drawings to solve arithmetic word problems. Journal of Educational Research, 83, 301-312.

Steps:

1. To introduce students to the drawing strategy, the teacher hands out a worksheet containing at least six word problems. The teacher explains to students that making a picture of a word problem sometimes makes that problem clearer and easier to solve.
2. The teacher and students then independently create drawings of each of the problems on the worksheet.
3. The students show their drawings for each problem, explaining each drawing and how it relates to the word problem. The teacher also participates, explaining his or her drawings to the class or group.
4. Students are directed independently to make drawings as an intermediate problem-solving step when they are faced with challenging word problems.

NOTE: This strategy appears to be more effective when used in later, rather than earlier elementary grades.

Math Vocabulary: Preteach, Model, and Use Standard Math Terms

Description: These three strategies can help students learn essential math vocabulary: preteaching key vocabulary items, modeling those vocabulary words, and using only universally accepted math terms in instruction.

Materials: key math vocabulary

Reference: Chard, D. (n.d..) Vocabulary strategies for the mathematics classroom. Retrieved November 23, 2007, from http://www.eduplace.com/state/pdf/author/chard_hmm05.pdf

Steps:

1. Preteach key math vocabulary. Math vocabulary provides students with the language tools to grasp abstract mathematical concepts and to explain their own reasoning. Therefore, do not wait to teach that vocabulary only at 'point of use.' Instead, preview relevant math vocabulary as a regular part of the 'background' information that students receive in preparation to learn new math concepts or operations.
2. Model the relevant vocabulary when new concepts are taught. Strengthen students' grasp of new vocabulary by reviewing a number of math problems with the class, each time consistently and explicitly modeling the use of appropriate vocabulary to describe the concepts being taught. Have students engage in cooperative learning or individual practice activities in which they too must successfully use the new vocabulary—while the teacher provides targeted support to students as needed.

3. Ensure that students learn standard, widely accepted labels for common math terms and operations and that they use them consistently to describe their math problem-solving efforts.

Improving Performance Through a 4-Step Problem-Solving Approach *(Pólya, 1957; Williams, 2003)*

School-Based Intervention Idea from www.interventioncentral.org

Description: Students can consistently perform better on applied math problems if they follow an efficient 4-step plan of understanding the problem, devising a plan, carrying out the plan, and looking back.

Materials: 4-step plan – Understand the problem, Devise a plan, Carry out the plan, Look back

References: Pólya, G. (1957). How to solve it (2nd ed.). Princeton University Press: Princeton, N.J. Williams, K. M. (2003). Writing about the problem solving process to improve problem-solving performance. Mathematics Teacher, 96(3), 185-187.

Steps:

1. UNDERSTAND THE PROBLEM. To fully grasp the problem, the student may restate the problem in his or her own words, note key information, and identify missing information.
2. DEVISE A PLAN. In mapping out a strategy to solve the problem, the student may make a table, draw a diagram, or translate the verbal problem into an equation.
3. CARRY OUT THE PLAN. The student implements the steps in the plan, showing work and checking work for each step.
4. LOOK BACK. The student checks the results. If the answer is written as an equation, the student puts the results in words and checks whether the answer addresses the question posed in the original word problem.

Using Question-Answer Relationships (QARs) to Interpret Math Graphics

School-Based Intervention Idea from www.interventioncentral.org

Description: Struggling learners in math often misread or misinterpret math graphics. One instructional strategy is to have them apply reading comprehension. Teachers use a 4-step instructional sequence to teach students to use Question-Answer Relationships (QARs) to better interpret math graphics.

Teachers need an instructional strategy to encourage students to be more savvy interpreters of graphics in applied math problems. One idea is to have them apply a reading comprehension strategy, Question-Answer Relationships (QARs) as a tool for analyzing math graphics. The four QAR question types (Raphael, 1982, 1986) are as follows:

- RIGHT THERE questions are fact-based and can be found in a single sentence, often accompanied by 'clue' words that also appear in the question.
- THINK AND SEARCH questions can be answered by information in the text--but require the scanning of text and the making of connections between disparate pieces of factual information found in different sections of the reading.
- AUTHOR AND YOU questions require that students take information or opinions that appear in the text and combine them with the reader's own experiences or opinions to formulate an answer.
- ON MY OWN questions are based on the students' own experiences and do not require knowledge of the text to answer.

Materials:

- Examples of different types of graphics.
- Series of data questions and correct answers.
- Set of 4 index cards with titles and descriptions of each of the 4 QAR questions for each student: Right There, Think and Search, Author and You, On My Own. (TMESAVING TIP: Students can create their own copies of these QAR review cards as an in-class activity.)
- A laminated reference card with 6 steps to follow whenever they attempt to solve an applied problem that includes a math graphic:

References:

Mesmer, H.A.E., & Hutchins, E.J. (2002). Using QARs with charts and graphs. The Reading Teacher, 56, 21–27.

Raphael, T. (1982). Question-answering strategies for children. The Reading Teacher, 36, 186-190.
Raphael, T. (1986). Teaching question answer relationships, revisited. The Reading Teacher, 39, 516-522.

Steps

Teachers use a 4-step instructional sequence to teach students to use Question-Answer Relationships (QARs) to better interpret math graphics:

1. **Distinguishing Among Different Kinds of Graphics**

   Students are first taught to differentiate between five common types of math graphics: table (grid with information contained in cells), chart (boxes with possible connecting lines or arrows), picture (figure with labels), line graph, bar graph.

   Students note significant differences between the various types of graphics, while the teacher records those observations on a wall chart. Next students are shown examples of graphics and directed to identify the general graphic type (table, chart, picture, line graph, bar graph) that each sample represents.

   As homework, students are assigned to go on a 'graphics hunt', locating graphics in magazines and newspapers, labeling them, and bringing them to class to review.

2. **Interpreting Information in Graphics**

   Over several instructional sessions, students learn to interpret information contained in various types of math graphics. For these activities, students are paired off, with stronger students matched with less strong ones.

   The teacher sets aside a separate session to introduce each of the graphics categories. The presentation sequence is ordered so that students begin with examples of the most concrete graphics and move toward the more abstract. The graphics sequence in order of increasing difficulty is: Pictures > tables > bar graphs > charts > line graphs.

   At each session, student pairs examine examples of graphics from the category being explored that day and discuss questions such as: "What information does this graphic present? What are strengths of this type of graphic for presenting data? What are possible weaknesses?" Student pairs record their findings and share them with the large group at the end of the session.

3. **Linking the Use of Question-Answer Relations (QARs) to Graphics**

   In advance of this lesson, the teacher prepares a series of data questions and correct answers. Each question and answer is paired with a math graphic that contains information essential for finding the answer.

   At the start of the lesson, students are each given a set of 4 index cards with titles and descriptions of each of the 4 QAR questions: RIGHT THERE, THINK AND SEARCH, AUTHOR AND YOU, ON MY OWN. (TMESAVING TIP: Students can create their own copies of these QAR review cards as an in-class activity.)

   Working first in small groups and then individually, students read each teacher-prepared question, study the matching graphic, and 'verify' the provided answer as correct. They then identify the type of question being posed in that applied problem, using their QAR index cards as a reference.

4. **Using Question-Answer Relationships (QARs) Independently to Interpret Math Graphics**

   Students are now ready to use the QAR strategy independently to interpret graphics. They are given a laminated card as a reference with 6 steps to follow whenever they attempt to solve an applied problem that includes a math graphic:

   - Read the question,
   - Review the graphic,
   - Reread the question,
   - Choose the appropriate QAR,
   - Answer the question, and
   - Locate the answer derived from the graphic in the answer choices offered.

Students are strongly encouraged NOT to read the answer choices offered on a multiple-choice item until they have first derived their own answer-to prevent those choices from short-circuiting their inquiry.

References

Mesmer, H.A.E., & Hutchins, E.J. (2002). Using QARs with charts and graphs. *The Reading Teacher, 56*, 21-27.

Raphael, T. (1982). Question-answering strategies for children. *The Reading Teacher, 36*, 186-190.

Raphael, T. (1986). Teaching question answer relationships, revisited. *The Reading Teacher, 39,* 516-522.

Boost Fluency Through Explicit Time-Drills *(Rhymer, Skinner, Jackson, McNeill, Smith & Jackson, 2002; Skinner, Pappas & Davis, 2005; Woodward, 2006)*

School-Based Intervention Idea from www.interventioncentral.org

Explicit time-drills are a method to boost students' rate of responding on math-fact worksheets.

The teacher hands out the worksheet. Students are told that they will have 3 minutes to work on problems on the sheet. The teacher starts the stop watch and tells the students to start work. At the end of the first minute in the 3-minute span, the teacher 'calls time', stops the stopwatch, and tells the students to underline the last number written and to put their pencils in the air. Then students are told to resume work and the teacher restarts the stopwatch. This process is repeated at the end of minutes 2 and 3. At the conclusion of the 3 minutes, the teacher collects the student worksheets. TIPS: Explicit time-drills work best on 'simple' math facts requiring few computation steps. They are less effective on more complex math facts. Also, a less intrusive and more flexible version of this intervention is to use time-prompts while students are working independently on math facts to speed their rate of responding. For example, at the end of every minute of seatwork, the teacher can call the time and have students draw a line under the item that they are working on when that minute expires.

References

Rhymer, K. N., Skinner, C. H., Jackson, S., McNeill, S., Smith, T., & Jackson, B. (2002). The 1-minute explicit timing intervention: The influence of mathematics problem difficulty. Journal of Instructional Psychology, 29(4), 305-311.

Skinner, C. H., Pappas, D. N., & Davis, K. A. (2005). Enhancing academic engagement: Providing opportunities for responding and influencing students to choose to respond. Psychology in the Schools, 42, 389-403.

Woodward, J. (2006). Developing automaticity in multiplication facts integrating strategy instruction with timed practice drills. Learning Disability Quarterly, 29, 269-289.

Motivate With 'Errorless Learning' Worksheets *(Caron, 2007)*

School-Based Intervention Idea from www.interventioncentral.org

Reluctant students can be motivated to practice math number problems to build computational fluency when given worksheets that include an answer key (number problems with correct answers) displayed at the top of the page.

In this version of an 'errorless learning' approach, the student is directed to complete math facts as quickly as possible. If the student comes to a number problem that he or she cannot solve, the student is encouraged to locate the problem and its correct answer in the key at the top of the page and write it in. Such speed drills build computational fluency while promoting students' ability to visualize and to use a mental number line. TIP: Consider turning this activity into a 'speed drill'. The student is given a kitchen timer and instructed to set the timer for a predetermined span of time (e.g., 2 minutes) for each drill. The student completes as many problems as possible before the timer rings. The student then graphs the number of problems correctly computed each day on a time-series graph, attempting to better his or her previous score.

References

Caron, T. A. (2007). Learning multiplication the easy way. The Clearing House, 80, 278-282.

Two Ideas to Jump-Start Active Academic Responding *(Skinner, Pappas & Davis, 2005)*

School-Based Intervention Idea from www.interventioncentral.org

Research shows that when teachers use specific techniques to motivate their classes to engage in higher rates of active and accurate academic responding, student learning rates are likely to go up.

Here are two ideas to accomplish increased academic responding on math tasks. First, break longer assignments into shorter assignments with performance feedback given after each shorter 'chunk' (e.g., break a 20-minute math computation worksheet task into 3 seven-minute assignments). Breaking longer assignments into briefer segments also allows the teacher to praise struggling students more frequently for work completion and effort, providing an additional 'natural' reinforcer. Second, allow students to respond to easier practice items orally rather than in written form to speed up the rate of correct responses.

References

Skinner, C. H., Pappas, D. N., & Davis, K. A. (2005). Enhancing academic engagement: Providing opportunities for responding and influencing students to choose to respond. Psychology in the Schools, 42, 389-403.

Cover-Copy-Compare

School-Based Intervention Idea from www.interventioncentral.org

Students who can be trusted to work independently and need extra drill and practice with math computational problems, spelling, or vocabulary words will benefit from Cover-Copy-Compare.

Preparing Cover-Copy-Compare Worksheets:

The teacher prepares worksheets for the student to use independently:

- For math worksheets, computation problems with answers appear on the left side of the sheet. The same computation problems appear on the right side of the page, unsolved. Here is a sample CCC item for math:
- For spelling words, correctly spelled words are listed on the left of the page, with space on the right for the student to spell each word.

- For vocabulary items, words and their definitions are listed on the left side of the page, with space on the right for the student to write out each word and a corresponding definition for that word.

Using Cover-Copy-Compare Worksheets for Student Review:

When first introducing Cover-Copy-Compare worksheets to the student, the teacher gives the student an index card. The student is directed to look at each correct item (e.g., correctly spelled word, computation problem with solution) on the left side of the page.

- (For math problems.) The student is instructed to cover the correct model on the left side of the page with an index card and to copy the problem and compute the correct answer in the space on the right side of the sheet. The student then uncovers the correct answer on the left and checks his or her own work.
- (For spelling problems.) The student is instructed to cover the correct model on the left side of the page with an index card and to spell the word in the space on the right of the sheet. The student then uncovers the correct answer on the left to check his or her work.
- (For vocabulary items.) The student is instructed to cover the correct model on the left side of the page with an index card and to write both the word and its definition in the space on the right side of the sheet. The student then uncovers the correct model on the left to check his or her work.

Promote Mastery of Math Facts Through Incremental Rehearsal

School-Based Intervention Idea from www.interventioncentral.org.

Incremental rehearsal builds student fluency in basic math facts ('arithmetic combinations') by pairing unknown computation items with a steadily increasing collection of known items. This intervention makes use of concentrated practice to promote fluency and guarantees that the student will experience a high rate of success.

Materials

- Index cards & pen

Steps to Implementing This Intervention

In preparation for this intervention:

1. The tutor first writes down on an index card in ink each math fact that a student is expected to master-but without the answer. NOTE: Educators can use the A-Plus Math Flashcard Creator, a free on-line application, to make and print flashcards in addition, subtraction, multiplication, and division. The web address for the flashcard creator is: http://www.aplusmath.com/Flashcards/Flashcard_Creator.html

2. The tutor reviews the collection of math-fact cards with the student. Any of the math facts that the student can orally answer correctly within two seconds are considered to be known problems and are separated into one pile. Math facts that the student cannot yet answer correctly within two seconds are considered 'unknown' and collected in a second pile -- the 'unknown facts' deck.

3. The tutor next randomly selects 9 cards from the pile of known math facts and sets this subset of cards aside as the 'known facts' deck. The rest of the pile of cards containing known math facts is put away ('discard deck'), not to be used further in this intervention.

During each day of the intervention:

The tutor follows an incremental-rehearsal sequence each day when working with the student:

1. First, the tutor takes a single card from the 'unknown facts' deck. The tutor reads the math fact on the card aloud, provides the answer, and prompts the student to read off and answer the same unknown problem.

2. Next the tutor takes one math fact from the 'known facts' deck and pairs it with the unknown problem. When shown the two problems in sequence, the student is asked during the presentation of each math fact to read off the problem and answer it. The student is judged to be successful on a problem if he or she orally provides the correct answer to that problem within 2 seconds. If the student commits an error on any card or hesitates for longer than two seconds, the tutor reads the math fact on the card aloud, gives the answer, then prompts the student to read off the same unknown problem and provide the answer. This review sequence continues until the student answers all cards within two seconds without errors.

3. The tutor then repeats the sequence--taking yet another problem from the 'known facts' deck to add to the expanding collection of math facts being reviewed ('review deck'). Each time, the tutor prompts the student to read off and answer the whole series of math facts in the review deck, beginning with the unknown fact and then moving through the growing series of known facts that follow it.

4. When the review deck has expanded to include one 'unknown' math fact followed by nine 'known' math facts (a ratio of 90 percent 'known' material to 10 percent 'unknown' material), the last 'known' math fact that was added to the student's review deck is discarded (put away with the 'discard deck'). The previously 'unknown' math fact that the student has just successfully practiced in multiple trials is now treated as a 'known' math fact and is included as the first item in the nine-card 'known facts' deck for future drills.

5. The student is then presented with a new math fact to answer, taken from the 'unknown facts' deck. With each new 'unknown' math fact, the review sequence is again repeated as described above until the 'unknown' math fact is grouped incrementally with nine math facts from the 'known facts' deck-and on and on.

Daily review sessions are discontinued either when time runs out or when the student answers an 'unknown' math fact incorrectly three times.

References

Burns, M. K. (2005). Using incremental rehearsal to increase fluency of single-digit multiplication facts with children identified as learning disabled in mathematics computation. *Education and Treatment of Children, 28*, 237-249.

Increase Accuracy by Intermixing Easy and Challenging Computation Problems

School-Based Intervention Idea from www.interventioncentral.org.

Teachers can improve accuracy and positively influence the attitude of students when completing math-fact worksheets by intermixing 'easy' problems among the 'challenging' problems. Research shows that students are more motivated to complete computation worksheets when they contain some very easy problems interspersed among the more challenging items.

Materials

- Math computation worksheets & answer keys with a mixture of difficult and easy problems

Steps to Implementing This Intervention

1. The teacher first identifies one or more 'challenging' problem-types that are matched to the student's current math-computation abilities (e.g., multiplying a 2-digit number by a 2-digit number with regrouping).

2. The teacher next identifies an 'easy' problem-type that the students can complete very quickly (e.g., adding or subtracting two 1-digit numbers).

3. The teacher then creates a a series of student math computation worksheets with 'easy' computation problems interspersed at a fixed rate among the 'challenging' problems. (NOTE: Instructions are included below for creating interspersal worksheets using a free online application from www.interventioncentral.org.)

    - If the student is expected to complete the worksheet independently as seat work or homework, 'challenging' and 'easy' problems should be interspersed at a 1:1 ratio (that is, every 'challenging' problem in the worksheet is followed by an 'easy' problem).

    - If the student is to have the problems read aloud and then asked to solve the problems mentally and write down only the answer, the items should appear on the worksheet at a ratio of 3:1 (that is, every third 'challenging' problem is followed by an 'easy' one).

Directions for On-Line Creation of Worksheets With a Mix of Easy and Challenging Computation Problems ('Interspersal Worksheets')

By following the directions below, teachers can use a free on-line Math Worksheet Generator to create computation worksheets with easy problems interspersed among more challenging ones:

- The teacher goes to the following URL for the Math Worksheet Generator: http://www.interventioncentral.org/htmdocs/tools/mathprobe/allmult.php

- Displayed on that Math Worksheet Generator web page is a series of math computation goals for addition, subtraction, multiplication, and division. Teachers can select up to five different problem types to appear on a student worksheet. Each problem type is selected by clicking on the checkbox next to it.

- It is simple to create a worksheet with a 1:1 ratio of challenging and easy problems (that is, with an easy problem following every challenging problem). First, the teacher clicks the checkbox next to an 'easy' problem type that the student can compute very quickly (e.g., adding or subtracting two 1-digit numbers). Next the teacher selects a 'challenging' problem type that is instructionally appropriate for the student (e.g., multiplying a 2-digit number by a 2-digit number with regrouping). Then the teacher clicks the 'Multiple Skill Computation Probe' button. The computer program will then automatically create a student computation worksheet and teacher answer key with alternating easy and challenging problems.

- It is also convenient to create a worksheet with a higher (e.g., 2:1, 3:1, or 4:1) ratio of challenging problems to easy problems. The teacher first clicks the checkbox next to an 'easy' problem type that the student can compute very quickly (e.g., adding or subtracting two 1-digit numbers). The teacher then selects up to four different challenging problem types that are instructionally appropriate to the student. Depending on the number of challenging problem types selected, when the teacher clicks the 'Multiple Skill Computation Probe' button, the computer program will create a student computation worksheet and teacher answer key that contain 2 (or 3 or 4) challenging problems for every easy problem.

Because the computer program generates new worksheets each time it is used, the teacher can enter the desired settings and -in one sitting-- create and print off enough worksheets and answer keys to support a six- or eight-week intervention.

References

Hawkins, J., Skinner, C. H., & Oliver, R. (2005). The effects of task demands and additive interspersal ratios on fifth-grade students' mathematics accuracy. *School Psychology Review, 34*, 543-555.

Increase Accuracy and Productivity Rates Via Self-Monitoring and Performance Feedback

School-Based Intervention Idea from www.interventioncentral.org.

Students can improve both their accuracy and fluency on math computation worksheets by independently self-monitoring their computation speed, charting their daily progress, and earning rewards for improved performance.

Materials

- Collection of student math computation worksheets & matching answer keys (NOTE: Educators can use a free online application to create math computation worksheets and answer keys at http://www.interventioncentral.org/htmdocs/tools/mathprobe/addsing.php)

  Student self-monitoring chart (Click to view a sample progress-monitoring chart)

Steps to Implementing This Intervention

In preparation for this intervention:

- the teacher selects one or more computation problem types that the student needs to practice. Using that set of problem types as a guide, the teacher creates a number of standardized worksheets with similar items to be used across multiple instructional days. (A Math Worksheet Generator that will create these worksheets automatically can be accessed at http://www.interventioncentral.org).

- the teacher prepares a progress-monitoring chart. The vertical axis of the chart extends from 0 to 100 and is labeled 'Correct Digits' The horizontal axis of the chart is labeled 'Date'.

- the teacher creates a menu of rewards that the student can choose from on a given day if the student was able to exceed his or her previously posted computation fluency score.

At the start of the intervention, the teacher meets with the student. The teacher shows the student a sample math computation worksheet and answer key. The teacher tells the student that the student will have the opportunity to complete similar math worksheets as time drills and chart the results. The student is told that he or she will win a reward on any day when the student's number of correctly computed digits on the worksheet exceeds that of the previous day.

During each day of the intervention:

1. The student is given one of the math computation worksheets previously created by the teacher, along with an answer key. The student first consults his or her progress-monitoring chart and notes the most recent charted computation fluency score previously posted. The student is encouraged to try to exceed that score.

2. When the intervention session starts, the student is given a pre-selected amount of time (e.g., 5 minutes) to complete as many problems on the computation worksheet as possible. The student sets a timer for the allocated time and works on the computation sheet until the timer rings.

3. The student then uses the answer key to check his or her work, giving credit for each correct digit in an answer. (A 'correct digits' is defined as a digit of the correct value that appears in the correct place-value location in an answer. In this scoring method, students can get partial credit even if some of the digits in an answer are correct and some are incorrect.).

4. The student plots his or her computational fluency score on the progress-monitoring chart and writes the current date at the bottom of the chart below the plotted data point. The student is allowed to select a choice from the reward menu if he or she exceeds the most recent, previously posted fluency score.

References

Bennett, K., & Cavanaugh, R. A. (1998). Effects of immediate self-correction, delayed self-correction, and no correction on the acquisition and maintenance of multiplication facts by a fourth-grade student with learning disabilities. *Journal of Applied Behavior Analysis, 31*, 303-306.

Shimabukuro, S. M., Prater, M. A., Jenkins, A., & Edelen-Smith, P. (1999). The effects of self-monitoring of academic performance on students with learning disabilities and ADD/ADHD.*Education and Treatment of Children, 2*2, 397-414.

Consolidate Student Learning During Lecture Through the Peer-Guided Pause *(Hawkins, & Brady, 1994)*

School-Based Intervention Idea from www.interventioncentral.org

During large-group math lectures, teachers can help students to retain more instructional content by incorporating brief Peer Guided Pause sessions into lectures.

Students are trained to work in pairs. At one or more appropriate review points in a lecture period, the instructor directs students to pair up to work together for 4 minutes. During each Peer Guided Pause, students are given a worksheet that contains one or more correctly completed word or number problems illustrating the math concept(s) covered in the lecture. The sheet also contains several additional, similar problems that pairs of students work cooperatively to complete, along with an answer key. Student pairs are reminded to (a) monitor their understanding of the lesson concepts; (b) review the correctly math model problem; (c) work cooperatively on the additional problems, and (d) check their answers. The teacher can direct student pairs to write their names on the practice sheets and collect them as a convenient way to monitor student understanding.

References

Hawkins, J., & Brady, M. P. (1994). The effects of independent and peer guided practice during instructional pauses on the academic performance of students with mild handicaps. Education & Treatment of Children, 17 (1), 1-28.

Increase Student Engagement and Improve Group Behaviors With Response Cards *(Armendariz & Umbreit, 1999; Lambert, Cartledge, Heward & Lo, 2006)*

School-Based Intervention Idea from www.interventioncentral.org.

Response cards can increase student active engagement in group math activities while reducing disruptive behavior.

In the group-response technique, all students in the classroom are supplied with an erasable tablet ('response card'), such as a chalk slate or laminated white board with erasable marker. The teacher instructs at a brisk pace. The instructor first poses a question to the class. Students are given sufficient wait time for each to write a response on his or her response card. The teacher then directs students to present their cards. If most or all of the class has the correct answer, the teacher praises the group. If more than one quarter of the students records an incorrect answer on their cards, however, the teacher uses guided questions and demonstration to steer students to the correct answer.

References

Armendariz, F., & Umbreit, J. (1999). Using active responding to reduce disruptive behavior in a general education classroom. Journal of Positive Behavior Interventions, 1(3), 152-158.

Lambert, M. C., Cartledge, G., Heward, W. L., & Lo, Y. (2006). Effects of response cards on disruptive behavior and academic responding during math lessons by fourth-grade urban students. Journal of Positive Behavior Interventions, 8(2), 88-99.

Maintain a Supportive Atmosphere for Classroom "Math Talk" *(Cooke & Adams, 1998)*

School-Based Intervention Idea from www.interventioncentral.org

Teachers can promote greater student 'risk-taking' in mathematics learning when they cultivate a positive classroom atmosphere for math discussions while preventing peers from putting each other down.

The teacher models behavioral expectations for open, interactive discussions, praises students for their class participation and creative attempts at problem-solving, and regularly points out that incorrect answers and misunderstandings should be celebrated—as they often lead to breakthroughs in learning. The teacher uses open-ended comments (e.g., "What led you to that answer?") as tools to draw out students and encourage them to explore and apply math concepts in group discussion. Students are also encouraged in a supportive manner to evaluate each other's reasoning. However, the teacher intervenes immediately to prevent negative student comments or 'put-downs' about peers. As with any problem classroom behavior, a first offense requires that the student meet privately with the instructor to discuss teacher expectations for positive classroom behavior. If the student continues to put down peers, the teacher imposes appropriate disciplinary consequences.

References

Cooke, L B. & Adams, V. M. (1998). Encouraging "math talk" in the classroom. Middle School Journal, 29(5), 35-40.

Support Students Through a Wrap-Around Instruction Plan *(Montague, 1997; Montague, Warger & Morgan, 2000)*

School-Based Intervention Idea from www.interventioncentral.org.

When teachers instruct students in more complex math cognitive strategies, they must support struggling learners with a 'wrap-around' instructional plan.

That plan incorporates several elements: (a) Assessment of the student's problem-solving skills. The instructor first verifies that the student has the necessary academic competencies to learn higher-level math content, including reading and writing skills, knowledge of basic math operations, and grasp of required math vocabulary. (b) Explicit instruction. The teacher presents new math content in structured, highly organized lessons. The instructor also uses teaching tools such as Guided Practice (moving students from known material to new concepts through a thoughtful series of teacher questions) and 'overlearning' (teaching and practicing a skill with the class to the point at which students develop automatic recall and control of it). (c) Process modeling. The teacher adopts a 'think aloud' approach, or process modeling, to verbally reveal his or her cognitive process to the class while using a cognitive strategy to solve a math problem. In turn, students are encouraged to think aloud when applying the same strategy—first as part of a whole-class or cooperative learning group, then independently. The teacher observes students during process modeling to verify that they are correctly applying the cognitive strategy. (d) Performance feedback. Students get regular performance feedback about their level of mastery in learning the cognitive strategy. That feedback can take many forms, including curriculum-based measurement, timely corrective feedback, specific praise and encouragement, grades, and brief teacher conferences. (e) Review of mastered skills or material. Once the student has mastered a cognitive strategy, the teacher structures future class lessons or independent work to give the student periodic opportunities to use and maintain the strategy. The teacher also provides occasional brief 'booster sessions', reteaching steps of the cognitive strategy to improve student retention.

References

Montague, M. (1997). Cognitive strategy instruction in mathematics for students with learning disabilities. Journal of Learning Disabilities, 30, 164-177.

Montague, M., Warger, C., & Morgan, T. H. (2000). Solve it! Strategy instruction to improve mathematical problem solving.. Learning Disabilities Research & Practice, 15, 110-116.

Unlock the Thoughts of Reluctant Students Through Class Journaling *(Baxter, Woodward & Olson, 2005)*

School-Based Intervention Idea from www.interventioncentral.org.

Students can effectively clarify their knowledge of math concepts and problem-solving strategies through regular use of class 'math journals'.

Journaling is a valuable channel of communication about math issues for students who are unsure of their skills and reluctant to contribute orally in class. At the start of the year, the teacher introduces the journaling assignment, telling students that they will be asked to write and submit responses at least weekly to teacher-posed questions. At first, the teacher presents 'safe' questions that tap into the students' opinions and attitudes about mathematics (e.g., 'How important do you think it is nowadays for cashiers in fast-food restaurants to be able to calculate in their head the amount of change to give a customer?"). As students become comfortable with the journaling activity, the teacher starts to pose questions about the students' own mathematical thinking relating to specific assignments. Students are encouraged to use numerals, mathematical symbols, and diagrams in their journal entries to enhance their explanations. The teacher provides brief written comments on individual student entries, as well as periodic oral feedback and encouragement to the entire class on the general quality and content of class journal responses. Regular math journaling can prod students to move beyond simple 'rote' mastery of the steps for completing various math problems toward a deeper grasp of the math concepts that underlie and explain a particular problem-solving approach. Teachers will find that journal entries are a concrete method for monitoring student understanding of more abstract math concepts. To promote the quality of journal entries, the teacher might also assign them an effort grade that will be calculated into quarterly math report card grades.

References

Baxter, J. A., Woodward, J., & Olson, D. (2005). Writing in mathematics: An alternative form of communication for academically low-achieving students. Learning Disabilities Research & Practice, 20(2), 119–135.

Math Problem-Solving: Help Students Avoid Errors with the "Individualized Self-Correction Checklist" *(Zrebiec Uberti, Mastropieri & Scruggs, 2004)*

Description: Help students avoid errors with the 'Individualized Self-Correction Checklist.' Students can improve their accuracy on particular types of word and number problems by using an 'individualized self-instruction checklist' that reminds them to pay attention to their own specific error patterns.

Materials: Samples of student's typical errors

Reference: Zrebiec Uberti, H., Mastropieri, M. A., & Scruggs, T. E. (2004). Check it off: Individualizing a math algorithm for students with disabilities via self-monitoring checklists. Intervention in School and Clinic, 39, 269-275.

Steps:

1. Teacher meets with the student to create the 'individualized self-correction checklist.' Together they analyze common error patterns that the student tends to commit on a particular problem type (e.g., 'On addition problems that require carrying, I don't always remember to carry the number from the previously added column.').
2. For each type of error identified, the student and teacher together describe the appropriate step to take to prevent the error from occurring (e.g., 'When adding each column, make sure to carry numbers when needed.').
3. These self-check items are compiled into a single checklist. Students are then encouraged to use their individualized self-instruction checklist whenever they work independently on their number or word problems.

NOTE: As older students become proficient in creating and using these individualized error checklists, they can begin to analyze their own math errors and to make their checklists independently whenever they encounter new problem types.

Memorize a Story Grammar Checklist *(Reid & Lienemann, 2006)*

School-Based Intervention Idea from www.interventioncentral.org

Students write lengthier stories that include greater detail when they use a memorized strategy to judge their writing-in-progress.

These young writers are taught a simple mnemonic device with 7 elements: 'WWW, What=2, How = 2'. This mnemonic translates into a story grammar checklist: WHO the main character is; WHERE the story takes place; WHEN the story occurs; WHAT the main character(s) do or plan to do; WHAT happens next; HOW the story concludes; and HOW the character(s) feel about their experiences. Students are taught this strategy through teacher demonstration, discussion, teacher modeling; and student use of the strategy with gradually fading teacher support. When students use the

'WWW, What=2, How = 2' tactic independently, they may still need occasional prompting to use it in their writing. NOTE: Teachers can apply this intervention idea to any genre of writing (e.g., persuasive essay), distilling its essential elements into a similar short, easily memorized checklist to teach to students.

References

Reid, R. & Lienemann, T.O. (2006). Self-regulated strategy development for written expression with students with attention deficit/hyperactivity disorder. Exceptional Children, 73, 53-68.

Essentials of Good Teaching Benefit Struggling Writers *(Gersten, Baker, & Edwards,1999)*

School-Based Intervention Idea from www.interventioncentral.org.

Teachers are most successful in reaching students with writing delays when their instruction emphasizes the full writing process, provides strategy sheets, offers lots of models of good writing, and gives students timely editorial feedback.

Good instructors build their written expression lessons around the 3 stages of writing –planning, writing, and revision— and make those stages clear and explicit. Skilled instructors also provide students with 'think sheets' that outline step-by-step strategies for tackle the different phases of a writing assignment (e.g., taking concise notes from research material; building an outline; proofreading a draft). Students become stronger writers when exposed to different kinds of expressive text, such as persuasive, narrative, and expository writing. Teachers can make students more confident and self-sufficient as writers when they give them access to plentiful examples of good prose models that the student can review when completing a writing assignment. Finally, strong writing teachers provide supportive and timely feedback to students about their writing. When teachers or classmates offer writing feedback to the student, they are honest but also maintain an encouraging tone.

References

Gersten, R., Baker, S., & Edwards, L. (1999). Teaching expressive writing to students with learning disabilities: A meta-analysis. New York: National Center for Learning Disabilities.

Stimulate Interest With an Autobiography Assignment *(Bos & Vaughn, 2002)*

School-Based Intervention Idea from *www.interventioncentral.org*.

Assigning the class to write their own autobiographies can motivate hard-to-reach students who seem uninterested in most writing assignments.

Have students read a series of autobiographies of people who interest them. Discuss these biographies with the class. Then assign students to write their own autobiographies. (With the class, create a short questionnaire that students can use to interview their parents and other family members to collect information about their past.) Allow students to read their finished autobiographies for the class.

References

Bos, C.S. & Vaughn, S. (2002). Strategies for teaching students with learning and behavior problems. Boston: Allyn and Bacon.

Have Students Write Every Day *(Graham, Harris & Larsen, 2001)*

School-Based Intervention Idea from www.interventioncentral.org.

Short daily writing assignments can build student writing fluency and make writing a more motivating activity.

For struggling writers, formal writing can feel much like a foreign language, with its own set of obscure grammatical rules and intimidating vocabulary. Just as people learn another language more quickly and gain confidence when they use it frequently, however, poor writers gradually develop into better writers when they are prompted to write daily--and receive rapid feedback and encouragement about that writing. The teacher can encourage daily writing by giving short writing assignments, allowing time for students to journal about their learning activities, requiring that they correspond daily with pen pals via email, or even posting a question on the board as a bell-ringer activity that students can respond to in writing for extra credit. Short daily writing tasks have the potential to lower students' aversion to writing and boost their confidence in using the written word.

References

Graham, S., Harris, K. R., & Larsen, L. (2001). Prevention and intervention of writing difficulties for students with learning disabilities. Learning Disabilities Research & Practice, 16, 74-84.

Self-Monitor and Graph Results to Increase Writing Fluency *(Rathvon, 1999)*

School-Based Intervention Idea from www.interventioncentral.org.

Students gain motivation to write through daily monitoring and charting of their own and classwide rates of writing fluency.

At least several times per week, assign your students timed periods of 'freewriting' when they write in their personal journals. Freewriting periods all the same amount of time each day. After each freewriting period, direct each student to count up the number of words he or she has written in the daily journal entry (whether spelled correctly or not). Next, tell students to record their personal writing-fluency score in their journal and also chart the score on their own time-series graph for visual feedback. Then collect the day's writing-fluency scores of all students in the class, sum those scores, and chart the results on a large time-series graph posted at the front of the room. At the start of each week, calculate that week's goal of increasing total class words written by taking last week's score and increasing by five percent. At the end of each week, review the class score and praise students if they have shown good effort.

References

Rathvon, N. (1999). Effective school interventions. New York: Guilford Press.

Spelling: Leverage the Power of Memory Through Cover-Copy-Compare

(Murphy, Hern, Williams, & McLaughlin, 1990)

School-Based Intervention Idea from www.interventioncentral.org.

Students increase their spelling knowledge by copying a spelling word from a correct model and then recopying the same word from memory.

Give students a list of 10-20 spelling words, an index card, and a blank sheet of paper. For each word on the spelling list, the student (1) copies the spelling list item onto a sheet of paper, (2) covers the newly copied word with the index card, (3) writes the spelling word again on the sheet (spelling it from memory), and (4) uncovers the copied word and checks to ensure that the word copied from memory is spelled correctly. If that word is spelled incorrectly, the student repeats the sequence above until the word copied from memory is spelled correctly--then moves to the next word on the spelling list.

References

Murphy, J., Hern, C., Williams, R., & McLaughlin, T. (1990). The effects of the copy, cover, and compare approach in increasing spelling accuracy with learning disabled students. Contemporary Educational Psychology, 15, 378-386.

A Spelling Study Strategy

Helping Students Learn Unknown Spelling Words

Procedures:

This spelling strategy is intended to help students study unknown spelling words. Students need to be trained in the study method. Training in the use of the wordstudy strategy involves (1) modeling: the student watches the teacher model the procedure; (2) practice with assistance: under the direction of the teacher, the student practices using the procedure with several different words; and (3) demonstration of proficiency: if the student is able to successfully apply the wordstudy strategy to two consecutive words without any assistance, they may continue independently.

1. Say the word.

2. Write and say the word.
3. Check the word
4. Trace and say the word.
5. Write the word from memory and check your spelling

If the student misspells the word in step **5**, they need to repeat all the steps.

Spelling Self-Correction Methods

Overview: These strategies are centered around self-correction techniques requiring students to check and correct their own work, focusing directly on the task at hand. They are learner centered, and have been validated and replicated empirically.

Reference: Goddard, Y.L., & Heron, T.E. (1998, July/Aug). Please teacher, help me learn to spell better – Teach me self-correction. *Teaching Exceptional Children*, 38-43.

Letter-by-Letter Proofing

- Emphasizes the orthography (sequencing) of letters, and students use common proofreading marks to check their work.
- A five-column paper, oriented sideways, is provided to each student (see Figure 1).
  - 1st column – stimulus words written by teacher, parent, or scribe
  - The other 4 columns are blank, providing spaces for students to write words from dictation, proofread, and rewrite.
  - Before dictation, students fold the Word List column under so that the stimulus words cannot be seen.
- As words are dictated, students write them in the second column (Column 2, Figure 1).
- After all words in the spelling list have been dictated and written, students unfold the Word List column to check each word and to correct misspellings with one of four proofreading marks (^ = add; O = omit; ~ = reverse letters; and / = wrong letter) that they have learned and practiced beforehand.
- Then they either write corrected words in the third column (Column 3, Figure 1) or place a checkmark ( ) to signify that the word was spelled correctly on the initial trial.
- This sequence is repeated for the final two columns (4 and 5) until the 15 –20 minute spelling period is over.
- Figure one shows an example of how this process is done
- Words can be personalized, or adapted to curriculum.
- Students can be paired to dictate to each other, or by tape recording.
- Spelling lessons take place daily (Monday through Thursday) for the same amount of time each day (15 – 20 minutes), and tests on Friday.
- Each Monday through Thursday students receive a new sheet with the same words in the Word List column (words may be shuffled).

- Any words misspelled on Friday are carried over for the next week.

Whole-Word Proofing

- This is similar to Letter-by-Letter Proofing, except that students use a different process that doesn't involve proofreading marks.
- The same five-column format is used, but each cell in columns 2-5 is divided in half horizontally (see Figure 2) and students use one column for writing and proofing, as opposed to two columns in the Letter-by-Letter method.
- When the students write the words initially in the second column (column 2, Figure 2), that use the bottom half of the cell, below the dotted line, for that word.
- When they unfold the Word List column to check the words, they place a checkmark ( ) in the top half of the cell, above the dotted line, for the words that were spelled correctly.
- For misspelled words, they write the entire word above the misspelled one; no proofreading marks are used.
- Again, this procedure continues throughout the 15–20 minute spelling period.

Figure 1
Letter-by-Letter Proofreading

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5
	r			
horse	house	horse	horse	
better	better	better	better	√
			a	
passage	passage	passage	passge	passage
brain	brian	brain	brain	√
	e		e	
forget	forgot	forget	forgt	forget
	a		a	
measure	meesure	measure	mesure	measure
target	target	√	target	√
activate	activate	√	activate	√
	r		y	
forty	foty	forty	forti	forty
	na e		n e	
pinnacle	pineccal	pinnacle	pinacal	pinnacle

Figure 2
Whole-Word Corrections

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5
horse	horse	√	√	√
	house	horse	horse	horse
better	better	√	√	√
	bettter	better	better	
passage	passage	passage	passage	√
	passgae	passige	passge	passage
brain	brain	√	√	√
	brian	brain	brain	brain
forget	forget	forget	forget	√
	forgot	forgit	forgt	forget
measure	measure	measure	measure	measure
	meesure	mesure	mesure	measure
target	√	√	√	√
	target	target	target	target
activate	√	√	√	√
	activate	activate	activate	activate
forty	forty	√	forty	√
	foty	forty	forti	forty
pinnacle	pinnacle	pinnacle	pinnacle	√
	pineccal	pinnicle	pinacal	pinnalce

Source: Graham, S., & Freeman, S. (1986). Strategy training and teacher- vs. studentcontrolled study conditions: Effects on LD students' spelling performance. *Learning Disability Quarterly, 9*, 15-22.

Written Expression: *Defends*

This writing strategy is designed as a composition strategy. It is intended to help students write a paper defending a position.

Decide

• Decide on an exact position.

Examine

• Examine the reasons for the positions.

Form

• Form a list of points that explain each reason.

Expose

• Expose the position in the first sentence.

Note

• Note each reason and supporting points.

Drive

• Drive home the positioning the last sentence.

Search

• SEARCH for errors and correct.

- **S**ee if it makes sense
- **E**ject incomplete sentences
- **A**sk if it's convincing
- **R**eveal COPS errors & Correct
    - Capitalization
    - Overall appearance
    - Punctuation

    - Spelling
- **C**opy over neatly
- **H**ave a last look

References
Ellis, E., & Lenz, K. (1987). A component analysis of effective learning strategies for LD students. Learning Disabilities Focus, 2, 94-107.
Alley, G.R. (1988). Effects of generalization instruction on the written language performance of adolescents with learning disabilities in the mainstream classroom. Reading, Writing, and Learning Disabilities, 4, 291-309.

Teach Effective Test-Preparation Strategies *(Hong, Sas, & Sas, 2006)*

School-Based Intervention Idea from www.interventioncentral.org.

A comparison of the methods that high and low-achieving math students typically use to prepare for tests suggests that struggling math students need to be taught (1) specific test-review strategies and (2) time-management and self-advocacy skills.

Among review-related strategies, deficient test-takers benefit from explicit instruction in how to take adequate in-class notes; to adopt a systematic method to review material for tests (e.g., looking over their notes each night, rereading relevant portions of the math text, reviewing handouts from the teacher, etc.), and to give themselves additional practice in solving problems (e.g., by attempting all homework items, tackling additional problems from the text book, and solving problems included in teacher handouts). Deficient test-takers also require pointers in how to allocate and manage their study time wisely, to structure their study environment to increase concentration and reduce distractions, as well as to develop 'self-advocacy' skills such as seeking additional help from teachers when needed. Teachers can efficiently teach effective test-preparation methods as a several-session whole-group instructional module.

Reference

Hong, E., Sas, M., & Sas, J. C. (2006). Test-taking strategies of high and low mathematics achievers. Journal of Educational Research, 99(3), 144-155.

Good Behavior Game

(Commonly used in 1st-2nd grade classrooms as a behavior management strategy for decreasing aggressive/disruptive behavior) but research has shown its effectiveness in higher grades as well.

The Good Behavior Game is an approach to the management of classrooms behaviors that rewards children for displaying appropriate on-task behaviors during instructional times. The class is divided into two teams and a point is given to a team for any inappropriate behavior displayed by one of its members. The team with the fewest number of points at the Game's conclusion each day wins a group reward. If both teams keep their points below a preset level, then both teams share in the reward. The program was first tested in 1969; several research articles have confirmed that the Game is an effective means of increasing the rate of on-task behaviors while reducing disruptions in the classroom (Barrish, Saunders, & Wolf, 1969; Harris & Sherman, 1973; Medland & Stachnik, 1972).

The process of introducing the Good Behavior Game into a classroom is a relatively simple procedure. There are five steps involved in putting the Game into practice.

Steps in Implementing This Intervention:

Step 1: Decide when to schedule the Game. The teacher first decides during what period(s) of the school day the Game will be played. As a rule of thumb, instructors should pick those times when the entire class is expected to show appropriate academic behaviors. Blocks of time devoted to reading, math, content instruction, and independent seatwork would be most appropriate for putting the Game into effect./p>

Step 2: Clearly define the negative behaviors that will be scored during the Game. Teachers who have used the Good behavior Game typically define three types of negative behavior that will be scored whenever they appear during the Game. Those behaviors are:

- leaving one's seat,
- talking out, and
- engaging in disruptive behavior.

Out-of-seat behavior is defined as any incident in which a student leaves his or her seat without first getting permission from the teacher. Related behaviors, such as "scootching" one's seat toward another desk are usually scored as out-of-seat. Instructors often build in certain exceptions to this rule. For example, in some classrooms, children can take a pass to the bathroom, approach the teacher's desk for additional help, or move from one work site to another in the room without permission as long as these movements are conducted quietly and are a part of the accepted classroom routine. Children who leave their seats intending to complete an allowed activity but find that they cannot (e.g., walking toward the teacher's desk and then noticing that another student is already there) are not scored as being out of their seat if they quickly and quietly return to their desk.

Talking-out behavior is defined as any incident of talking out loud without the permission of the instructor. Permission is gained by raising one's hand and first being recognized by the teacher before speaking. Any type of unauthorized vocalization within the hearing of the instructor is scored as talking out, including shouts, nonsense noises (e.g., growling, howling, whistling), whispers, and talking while one's hand is raised.

Disruptive behavior consists of any movement or act that is judged by the teacher to be disruptive of classroom instruction. For example, knocking on a table, looking around the room, tearing up paper, passing notes, or playing with toys at one's desk would all be scored as disruptive behaviors. A good rule of thumb would be to regard as disruptive behavior any action that does not fall under another category but is perceived by the teacher as annoying or distracting.

Step 3: Decide upon suitable daily and (perhaps) weekly rewards for teams winning the Game.

Teachers will need to choose rewards that they feel will effectively motivate students to take part in the Game. Most often, instructors use free time as a daily reward, since children often find it motivating. To cite a single example, one teacher's reward system included giving her daily 4th-grade Game winners the privilege of wearing a "victory tag," putting a star next to their names on a "Winner's Chart," lining up first for lunch, and getting 30 minutes of time at the end of the day to work on fun, educationally related topics.

When choosing rewards, instructors are advised to consider using reinforcers that fit naturally into the context and mission of a classroom. For example, allowing winners to play quietly together at the end of the school day may help to promote social skills, but dispensing material rewards (e.g., comic books) to winners would probably be less likely to contribute directly to educational and social goals. Of course, if both teams win on a given day or a given week, the members of those teams all receive the same rewards.

Step 4: Introduce the Game to the class

Once behaviors have been selected and clearly defined by the teacher, the next step is to introduce the Game to the class. Ideally, time should be set aside for an initial group discussion. The teacher mentions that the class will be playing a game and presents a schedule clearly setting forth the instructional times during which the game will be in effect.

The teacher next divides the classroom into two teams. For ease of recording, it is usually recommended that the instructor divide the class down the center of the room into roughly equal halves. Some teachers have used three teams successfully as well. To build a sense of team spirit, students may be encouraged to name their groups.

The children are informed that certain types of behavior (i.e., leaving one's seat or talking without permission, and engaging in disruptive behaviors) will earn points for the team to which they belong. Students are also told that both teams can win if they earn no more than a certain number of points (e.g., 4 points maximum per day). If both teams happen to exceed 4 points, then the team with the lowest total at the end of the day is the winner. In case of a tie, both teams earn the reward. The instructor is the final judge of whether a behavior is to be scored. (As an option, students can also be told that the team with the fewest number of points at the end of the week will win an additional reward.)

It is a good idea when introducing the Game to students to clearly review examples of acceptable and unacceptable behaviors. After all, it is important that all children know the rules before the Game begins. To more effectively illustrate those rules, children may be recruited to demonstrate acceptable and unacceptable behaviors, or the teacher may describe a number of behaviors and ask the class to decide with a show of hands whether such behaviors are to be scored or not.

Step 5: Put the Game into effect.

The instructor is now ready to start the Game. During those times that the game is in effect in the classroom, the teacher continues to carry out his or her usual instructional practices. The only alteration in the routine is that the instructor is also noting and publicly recording any negative points incurred by either team. Instructors might want to post scores on the blackboard or on a large piece of paper visible to everyone in the room. If working with children in a small group, the instructor can record negative behaviors on a small note pad and later transfer them to the blackboard. Teachers can also choose to publicly announce when another point has been earned as a reminder to the class about acceptable behavior. It is helpful to keep a weekly tally of points for each team, especially if teams are competing for weekly as well as daily rewards.

Care should be taken to be as consistent as possible in scoring negative behaviors. Winning teams should be praised as well as rewarded for their efforts, with that praise tied when possible to specifically observed behaviors. Instructors may want to alter the Game somewhat as necessary (e.g., changing rewards or more carefully defining acceptable and unacceptable behaviors with students). Obviously, any alteration of the Game, no matter how small, should be shared with the classroom before being put into effect.

Troubleshooting: How to Deal With Common Problems in Using the 'Good Behavior Game'

Q: What should I do if a small number of students try to sabotage the game for other children by deliberately acting out and earning penalty points for their team?

If a small number of students are earning a large number of points during the Game, consider forming them into a separate team. While not the norm, occasionally a single student or small group of children may be tempted to undermine the Game by deliberately incurring a large number of penalty points for their teams. (Such children may find the resulting negative social attention of other members of their team to be its own reward!) A simple remedy for this problem is to modify the Game by making those disruptive students into a separate team. The Game will continue unchanged, except that your room will now have three teams rather than two competing for rewards.

Q: I have used the Good Behavior Game for a while and have found it to be effective. But lately it doesn't seem to have the same impact on my students. What do you recommend?

If the Good Behavior Game appears to be losing effectiveness over time, be sure that you are consistently noting and assigning team points for inappropriate behaviors and that you are avoiding verbal arguments with students. It is very important that points be assigned consistently when you witness inappropriate behavior; otherwise, the Game may not bring about the expected behavioral improvement among your students. Teachers using the Game sometimes find it helpful to have another adult familiar with the Good Behavior Game observe them and offer feedback about their consistency in assigning points and success in avoiding negative verbal exchanges with students.

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Check and Connect

(Dropout prevention program for high school students with learning, emotional, and/or behavioral disabilities)

Randomized controlled trials show a sizable decrease in students' dropout rates, and increase in attendance and academic credits earned.

Description of the intervention: Check and Connect is a dropout prevention program for high school students with learning, emotional, and/or behavioral disabilities. Students typically enter the program in 9th grade, and are assigned a "monitor" (e.g. a graduate student, special education teacher, or community member with experience in human services), who works with them year-round as a mentor, advisor, and service coordinator.

On a daily basis, monitors work with school personnel to track and document students' attendance, behavior (e.g. detention referrals, suspensions), and academic performance (e.g. course failure, credits earned).

Monitors meet at least monthly, and often weekly, with students to give them feedback on these measures of school engagement. During these meetings, monitors talk with students about how certain life choices might stand in the way of their graduating (e.g. engaging in criminal activity, abusing substances, having a child); convey a strong message about the importance of persisting in school; teach them effective problem-solving strategies and conflict-resolution skills; and help them develop a plan for making responsible life choices. Monitors also help students find productive extracurricular activities both during the school year and summer (e.g. sports, clubs, summer jobs).

Monitors meet more frequently with students who persistently exhibit high-risk behaviors, such as poor attendance/school performance, or severe behavioral problems. The monitors provide these students with more intensive, personalized assistance, such as finding a tutor for a student whose grades are slipping, or enrolling a student in a structured extracurricular activity to keep him or her away from a delinquent peer group.

Monitors also encourage students' parents to stay actively involved in their child's education – for example, by communicating frequently with their child's teachers.

Monitors typically work 20 to 35 hours per week while carrying an average caseload of approximately 35 students. They work with students for at least two years, wherever possible staying with the same students throughout high school even when they change schools within the school district.

The program is overseen at the school level by a program coordinator (e.g. special education coordinator, school psychologist, or special education resource teacher), who provides monitors with regular advice and feedback. Check and Connect costs approximately $1600 per student per year to implement, in 2006 dollars.

Click here for more information on Check and Connect.

Reference

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