RTI Toolkit: A Practical Guide for Schools

RTI: Academic Interventions for Difficult-to-Teach Students

Jim Wright, Presenter

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Weld Re-4 School District
Windsor, CO

Jim Wright
364 Long Road
Tully, NY 13159
Email: jim@jimwrightonline.com
Download workshop resources at: www.jimwrightonline.com/windsor.php

Paired Reading

Description: The student reads aloud in tandem with an accomplished reader. At a student signal, the helping reader stops reading, while the student continues on. When the student commits a reading error, the helping reader resumes reading in tandem.

Materials:

- Reading book

Preparation:

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

Intervention Script:

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.

2. Say 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."*

3. Begin reading aloud with the student. If the student misreads a word, point to the word and pronounce it. Then have the student repeat the word. When the student reads the word correctly, resume reading through the passage.

4. When the child delivers the appropriate signal (a hand tap), stop reading aloud and instead follow along silently as the student continues with oral reading. Be sure occasionally to praise the student in specific terms for good reading (e.g., "That was a hard word. You did a nice job sounding it out!").

5. If, while reading alone, the child either commits a reading error or hesitates for longer than 5 seconds, point to the error-word and pronounce it. Then tell the student to say the word. When the student pronounces the error-word correctly, begin reading aloud again in unison with the student.

6. Continue reading aloud with the student until he or she again signals to read alone.

Tips:
Paired reading is a highly structured but simple strategy that can easily be taught to others—including to school-age children and youth. If you have a pool of responsible older

students available you may want to create a cross-age peer tutoring program that uses paired reading as its central intervention. Or train parents to use this simple reading strategy when they read with their children at home.

References:

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

Reading Comprehension: Question-Generation

Description: 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.

Intervention Script:
1. Introduce this strategy to the class:

   A. 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.

   B. 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.

   C. 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.

   D. 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.

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

Tips:

Use "Gist" Sentences to Organize Student Research Notes. When students are writing research papers, they often find it challenging to synthesize their scattered research notes into an orderly outline with sequentially presented main ideas. Students who have mastered the skill of assembling key ideas into "gist" sentences can identify their most important research notes, copy these notes individually onto index cards, and group cards with related notes. The student can then write a single "gist" sentence for each pile of note cards and use these sentences as the starting point for a paper outline.

Collect Exemplary Examples of Student-Generated Questions as Study Aids. If your class is using an assigned textbook, you may want to collect well-written student-generated questions and share them with other students. Or assign students different sections of an article or book chapter and require that they 'teach' the content by presenting their text-generated questions and sharing the correct answers.

Select Student Questions As Quiz or Test Items. You can build classroom interest (and competition!) in using this question-generation strategy by occasionally using one or more student text-questions as quiz or test items.

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

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READING
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The ability to read allows individuals access to the full range of a culture's artistic and scientific knowledge. Reading is a complex act. Good readers are able fluently to decode the words on a page, to organize and recall important facts in a text, to distill from a reading the author's opinions and attitudes, and to relate the content of an individual text to a web of other texts previously read. The foundation that reading rests upon is the ability to decode. Emergent readers require the support of more accomplished readers to teach them basic vocabulary, demonstrate word attack strategies, model fluent reading, and provide corrective feedback and encouragement. Newly established readers must build fluency and be pushed to exercise their reading skills across the widest possible range of settings and situations. As the act of decoding becomes more effortless and automatic, the developing reader is able to devote a greater portion of cognitive energy to understanding the meaning of the text. Reading comprehension is not a single skill but consists of a cluster of competencies that range from elementary strategies for identifying and recalling factual content to highly sophisticated techniques for inferring an author's opinions and attitudes. As researcher Michael Pressley points out, reading comprehension skills can be thought of as unfolding along a timeline. Before beginning to read a particular selection, the skilled student reader must engage prior knowledge, predict what the author will say about the topic, and set specific reading goals. While reading, the good reader self-monitors his or her understanding of the text, rereads sentences and longer passages that are unclear, and updates predictions about the text based on what he or she has just read. After completing a text, the good reader summarizes its main points (perhaps writing them down), looks back in the text to clarify any points that are unclear, and continues to think about the text and its implications for a period of time. Reading comprehension can also be thought of as a bundle of interdependent skills that range from basic to more advanced. Teachers should ensure that students understand and appropriately use simple comprehension strategies (such as looking back in a text to clarify factual information) before teaching them advanced comprehension strategies such as SQ3R ('Survey, Question, Read, Recite, Review'). Ultimately, reading is a competency that is continually honed and improved over a lifetime. The teacher's goal is to build students into independent readers whose skills improve with self-guided practice. Below are a number of instructional strategies to promote word decoding, reading decoding, and reading comprehension.

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

Reading Comprehension: Activating Prior Knowledge *(Hansen, & Pearson, 1983)*. 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.

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

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

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

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

Reading Comprehension: Previewing the Chapter *(Gleason, Archer, & Colvin, 2002)*. 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.

Reading Comprehension: Question-Answer Relationships (QAR) *(Raphael, 1982; Raphael, 1986)*. 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.

Reading Comprehension: Reading Actively *(Gleason, Archer, & Colvin, 2002)*. 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.

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

Reading Fluency: Paired Reading *(Topping, 1987)*. 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.

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

Word Decoding: Drilling Error Words *(Jenkins & Larson, 1979)*. 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.

Word Decoding: Tackling Multi-Syllabic Words *(Gleason, Archer, & Colvin, 2002)*. 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.

Word Decoding: Teach a Hierarchy of Strategies *(Haring, Lovitt, Eaton & Hansen, 1978)*. 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.

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MATHEMATICS
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Mathematics instruction is a lengthy, incremental process that spans all grade levels. As children begin formal schooling in kindergarten, they develop 'number sense', an intuitive understanding of foundation number concepts and relationships among numbers. A central part of number sense is the student's ability to internalize the number line as a precursor to performing mental arithmetic. As students progress through elementary school, they must next master common math operations (addition, subtraction, multiplication, and division) and develop fluency in basic arithmetic combinations ('math facts'). In later grades, students transition to applied, or 'word', problems that relate math operations and concepts to real-world situations. Successful completion of applied problems requires that the student understand specialized math vocabulary, identify the relevant math operations needed to solve the problem while ignoring any unnecessary information also appearing in that written problem, translate the word problem from text format into a numeric equation containing digits and math symbols, and then successfully solve. It is no surprise, then, that there are a number of potential blockers to student success with applied problems, including limited reading decoding and comprehension skills, failure to acquire fluency with arithmetic combinations (math facts), and lack of proficiency with math operations. Deciding what specific math interventions might be appropriate for any student must therefore be a highly individualized process, one that is highly dependent on the student's developmental level and current math skills, the requirements of the school district's math curriculum, and the degree to which the student possesses or lacks the necessary auxiliary skills (e.g., math vocabulary, reading comprehension) for success in math. Here are some wide-ranging classroom (Tier I RTI) ideas for math interventions that extend from the primary through secondary grades.

Applied Problems: Encourage Students to Draw to Clarify Understanding *(Van Essen & Hamaker, 1990; Van Garderen, 2006)*. 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. 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. The teacher and students then independently create drawings of each of the problems on the worksheet. Next, 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. Then 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.

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

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

Math Computation: Motivate With 'Errorless Learning' Worksheets *(Caron, 2007)*. 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.

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

Math Homework: Motivate Students Through Reinforcers, Interesting Assignments, Homework Planners, and Self-Monitoring *(Bryan & Sullivan-Burstein, 1998)*. Improve students' rate of homework completion and quality by using reinforcers, motivating 'real-life' assignments, a homework planner, and student self-monitoring. (1) Reinforcers: Allow students to earn a small reward (e.g., additional free time) when they turn in all homework assignments for the week. (2) 'Real-life' Assignments: Make homework meaningful by linking concepts being taught to students' lives. In a math lesson on estimating area, for example, give students the homework task of calculating the area of their bedroom and estimating the amount of paint needed to cover the walls. (3) Homework Planner: Teach students to use a homework planner to write down assignments, organize any materials (e.g., worksheets) needed for homework, transport completed homework safely back to school, and provide space for parents and teachers to communicate about homework via written school-home notes. (4) Student Self-Monitoring: Direct students to chart their homework completion each week. Have students plot the number of assignments turned in on-time in green, assignments not turned in at all in red, and assignments turned in late in yellow.

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

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

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

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

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

Math Problem-Solving: Help Students Avoid Errors With the 'Individualized Self-Correction Checklist' *(Zrebiec Uberti, Mastropieri & Scruggs, 2004)*. 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. To create such a checklist, the teacher meets with the student. 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.'). 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.'). 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. 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.

Math Review: Balance Massed & Distributed Practice *(Carnine, 1997)*. Teachers can best promote students acquisition and fluency in a newly taught math skill by transitioning from massed to distributed practice. When students have just acquired a math skill but are not yet fluent in its use, they need lots of opportunities to try out the skill under teacher supervision—a technique sometimes referred to as 'massed practice'. Once students have developed facility and independence with that new math skill, it is essential that they then be required periodically to use the skill in order to embed and retain it—a strategy also known as 'distributed practice'. Teachers can program distributed practice of a math skill such as reducing fractions to least common

denominators into instruction either by (a) regularly requiring the student to complete short assignments in which they practice that skill in isolation (e.g., completing drill sheets with fractions to be reduced), or (b) teaching a more advanced algorithm or problem-solving approach that incorporates--and therefore requires repeated use of--the previously learned math skill (e.g., requiring students to reduce fractions to least-common denominators as a necessary first step to adding the fractions together and converting the resulting improper fraction to a mixed number).

Math Review: Teach Effective Test-Preparation Strategies *(Hong, Sas, & Sas, 2006)*. 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.

Math Vocabulary: Preteach, Model, and Use Standard Math Terms *(Chard, D., n.d.)*. Three strategies can help students to learn essential math vocabulary: preteaching key vocabulary items, modeling those vocabulary words, and using only universally accepted math terms in instruction. (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 a 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. Then 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.

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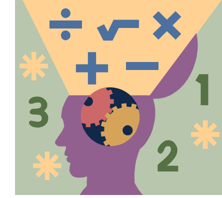
Math Computation: Increase Accuracy By Intermixing Easy and Challenging Problems



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 no problem 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.

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Combining Cognitive & Metacognitive Strategies to Assist Students With Mathematical Problem Solving

Solving an advanced math problem independently requires the coordination of a number of complex skills. The student must have the capacity to reliably implement the specific steps of a particular problem-solving process, or cognitive strategy. At least as important, though, is that the student must also possess the necessary metacognitive skills to analyze the problem, select an appropriate strategy to solve that problem from an array of possible alternatives, and monitor the problem-solving process to ensure that it is carried out correctly.

The following strategies combine both cognitive and metacognitive elements (Montague, 1992; Montague & Dietz, 2009). First, the student is taught a 7-step process for attacking a math word problem (cognitive strategy). Second, the instructor trains the student to use a three-part self-coaching routine for each of the seven problem-solving steps (metacognitive strategy).

In the cognitive part of this multi-strategy intervention, the student learns an explicit series of steps to analyze and solve a math problem. Those steps include:

1. **Reading the problem**. The student reads the problem carefully, noting and attempting to clear up any areas of uncertainly or confusion (e.g., unknown vocabulary terms).
2. **Paraphrasing the problem**. The student restates the problem in his or her own words.
3. **'Drawing' the problem**. The student creates a drawing of the problem, creating a visual representation of the word problem.
4. **Creating a plan to solve the problem**. The student decides on the best way to solve the problem and develops a plan to do so.
5. **Predicting/Estimating the answer**. The student estimates or predicts what the answer to the problem will be. The student may compute a quick approximation of the answer, using rounding or other shortcuts.
6. **Computing the answer**. The student follows the plan developed earlier to compute the answer to the problem.
7. **Checking the answer**. The student methodically checks the calculations for each step of the problem. The student also compares the actual answer to the estimated answer calculated in a previous step to ensure that there is general agreement between the two values.

The metacognitive component of the intervention is a three-part routine that follows a sequence of 'Say', 'Ask, 'Check'. For each of the 7 problem-solving steps reviewed above:

- The student first self-instructs by stating, or 'saying', the purpose of the step ('**Say**').
- The student next self-questions by 'asking' what he or she intends to do to complete the step ('**Ask**').
- The student concludes the step by self-monitoring, or 'checking', the successful completion of the step ('**Check**').

While the Say-Ask-Check sequence is repeated across all 7 problem-solving steps, the actual content of the student self-coaching comments changes across the steps.

Table 1 shows how each of the steps in the word problem cognitive strategy is matched to the three-part Say-Ask-Check sequence:

Table 1: 'Say-Ask-Check' Metacognitive Prompts Tied to a Word-Problem Cognitive Strategy (Montague, 1992)		
Cognitive Strategy Step	Metacognitive 'Say-Ask-Check' Prompt Targets	Sample Metacognitive 'Say-Ask-Check' Prompts
1. **Read the problem.**	**'Say' (Self-Instruction) Target:** *The student reads and studies the problem carefully before proceeding.* ***'Ask' (Self-Question) Target:*** *Does the student fully understand the problem?* ***'Check' (Self-Monitor) Target:*** *Proceed only if the problem is understood.*	**Say**: "I will read the problem. I will reread the problem if I don't understand it." **Ask**: "Now that I have read the problem, do I fully understand it?" **Check**: "I understand the problem and will move forward."
2. **Paraphrase the problem.**	**'Say' (Self-Instruction) Target:** *The student restates the problem in order to demonstrate understanding.* ***'Ask' (Self-Question) Target:*** *Is the student able to paraphrase the problem?* ***'Check' (Self-Monitor) Target:*** *Ensure that any highlighted key words are relevant to the question.*	**Say**: "I will highlight key words and phrases that relate to the problem question." "I will restate the problem in my own words." **Ask**: "Did I highlight the most important words or phrases in the problem?" **Check**: "I found the key words or phrases that will help to solve the problem."
3. **'Draw' the problem.**	**'Say' (Self-Instruction) Target:** *The student creates a drawing of the problem to consolidate understanding.* ***'Ask' (Self-Question) Target:*** *Is there a match between the drawing and the problem?* ***'Check' (Self-Monitor) Target:*** *The drawing includes in visual form the key elements of the math problem.*	**Say**: "I will draw a diagram of the problem." **Ask**: "Does my drawing represent the problem?" **Check**: "The drawing contains the essential parts of the problem."
4. **Create a plan to solve the problem.**	**'Say' (Self-Instruction) Target:** *The student generates a plan to solve the problem.* ***'Ask' (Self-Question) Target:*** *What plan will help the student to solve this problem?* ***'Check' (Self-Monitor) Target:*** *The plan is appropriate to solve the problem.*	**Say**: "I will make a plan to solve the problem." **Ask**: "What is the first step of this plan? What is the next step of the plan?" **Check**: "My plan has the right steps to solve the problem."
5. **Predict/estimate the**	**'Say' (Self-Instruction) Target:** *The student uses estimation or other strategies to predict or*	**Say**: "I will estimate what the answer will be."

Answer.	*estimate the answer.* ***'Ask' (Self-Question) Target:*** *What estimating technique will the student use to predict the answer?* ***'Check' (Self-Monitor) Target:*** *The predicted/estimated answer used all of the essential problem information.*	**Ask**: "What numbers in the problem should be used in my estimation?" **Check**: "I did not skip any important information in my estimation."
6. **Compute the answer.**	**'Say' (Self-Instruction) Target:** *The student follows the plan to compute the solution to the problem.* ***'Ask' (Self-Question) Target:*** *Does the answer agree with the estimate?* ***'Check' (Self-Monitor) Target:*** *The steps in the plan were followed and the operations completed in the correct order.*	**Say**: "I will compute the answer to the problem." **Ask**: "Does my answer sound right?" "Is my answer close to my estimate?" **Check**: "I carried out all of the operations in the correct order to solve this problem."
7. **Check the answer.**	**'Say' (Self-Instruction) Target:** *The student reviews the computation steps to verify the answer.* ***'Ask' (Self-Question) Target:*** *Did the student check all the steps in solving the problem and are all computations correct?* ***'Check' (Self-Monitor) Target:*** *The problem solution appears to have been done correctly.*	**Say**: "I will check the steps of my answer." **Ask**: "Did I go through each step in my answer and check my work?" **Check**: ""

Students will benefit from close teacher support when learning to combine the 7-step cognitive strategy to attack math word problems with the iterative 3-step metacognitive Say-Ask-Check sequence. Teachers can increase the likelihood that the student will successfully acquire these skills by using research-supported instructional practices (Burns, VanDerHeyden, & Boice, 2008), including:

- Verifying that the student has the necessary foundation skills to solve math word problems
- Using explicit instruction techniques to teach the cognitive and metacognitive strategies
- Ensuring that all instructional tasks allow the student to experience an adequate rate of success
- Providing regular opportunities for the student to be engaged in active accurate academic responding
- Offering frequent performance feedback to motivate the student and shape his or her learning.

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School-Wide Strategies for Managing...
WRITING

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The act of writing contains its own inner tensions. Writers must abide by a host of rules that govern the mechanics and conventions of writing yet are also expected—within the constraints of those rules-- to formulate original, even creative, thoughts. It is no wonder that many students find writing to be a baffling exercise and have little sense of how to break larger writing assignments into predictable, achievable subtasks. But of course writing can be taught and writing can be mastered. The best writing instruction places the process of written expression on a timeline: Good writers first plan their writing. Then they write. Once a draft has been created, good writers review and revise their work. While the stages of the writing process are generally sequential, good writers also find themselves jumping frequently between these stages (for example, collecting additional notes and writing new sections of a paper as part of the revision process). Depending upon their stage of development as writers, struggling student writers may benefit from the following strategies:

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

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

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

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

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

Organization: Build an Outline by Talking Through the Topic *(The Writing Center, University of North Carolina at Chapel Hill, n.d./ 23 December 2006)*. Students who struggle to organize their notes into a coherent outline can tell others what they know about the topic—and then capture the informal logical structure of that conversation to create a working outline. The student studies notes from the topic and describes what he or she knows about the topic and its significance to a listener. (The student may want to audio-record this conversation for later playback.) After the conversation, the student jots down an outline from memory to capture the structure and main ideas of the discussion. This outline 'kernel' can then be expanded and refined into the framework for a paper.

Organization: 'Reverse Outline' the Draft *(The Writing Center, University of North Carolina at Chapel Hill, n.d./ 23 December 2006)*. Students can improve the internal flow of their compositions through 'reverse outlining'. The student writes a draft of the composition. Next, the student reads through the draft, jotting notes in the margins that signify the main idea of each paragraph or section. Then the student organizes the margin notes into an outline to reveal the organizational structure of the paper. This 'reverse outline' allows the student to note whether sections of the draft are repetitious, are out of order, or do not logically connect with one another.

Planning: Brainstorm to Break the 'Idea' Logjam *(The Writing Center, University of North Carolina at Chapel Hill, n.d./ 28 December 2006)*. Brainstorming is a time-tested method that can help students to generate motivating topics for writing assignments and uncover new ideas to expand and improve their compositions. Here are four brainstorming strategies to teach to students: FREEWRITING: The student sets a time limit (e.g., 15 minutes) or length limit (e.g., one hand-written page) and spontaneously writes until the limit is reached. The writer does not judge the writing but simply writes as rapidly as possible, capturing any thought that comes to mind on the topic. Later, the student reviews the freewriting to pick out any ideas, terms, or phrasing that might be incorporated into the writing assignment. LISTING: The student selects a topic based on an idea or key term related to the writing assignment. The writer then rapidly brainstorms a list of any items that might possibly relate to the topic. Finally, the writer reviews the list to select items that

might be useful in the assigned composition or trigger additional writing ideas. SIMILES: The student selects a series of key terms or concepts linked to the writing assignment. The student brainstorms, using the framework of a simile: " _1_ is like _2_." The student plugs a key term into the first blank and then generates as many similes as possible (e.g., "A SHIP is like a CITY ON THE SEA."). REFERENCES: The student jots down key ideas or terms from the writing assignment. He or she then browses through various reference works (dictionaries, encyclopedias, specialized reference works on specific subjects) looking randomly for entries that trigger useful ideas. (Writers might try a variation of this strategy by typing assignment-related search terms into GOOGLE or another online search engine.)

Proofreading: Teach A Memory Strategy *(Bos & Vaughn, 2002)*. When students regularly use a simple, portable, easily memorized plan for proofreading, the quality of their writing can improve significantly. Create a poster to be put up in the classroom summarizing the SCOPE proofreading elements: (1) SPELLING: Are my words spelled correctly; (2) CAPITALIZATION: Have I capitalized all appropriate words, including first words of sentences, proper nouns, and proper names?; (3) ORDER of words: Is my word order (syntax) correct?; (4) PUNCTUATION: Did I use end punctuation and other punctuation marks appropriately? (5) EXPRESSION of complete thoughts: Do all of my sentences contain a noun and verb to convey a complete thought? Review the SCOPE proofreading steps by copying a first-draft writing sample onto an overhead and evaluating the sample with the class using each item from the SCOPE poster. Then direct students to pair off and together evaluate their own writing samples using SCOPE. When students appear to understand the use of the SCOPE plan, require that they use this strategy to proofread all written assignments before turning them in.

Proofreading: Use Selective Proofreading With Highlighting of Errors *(Frus, n.d./18 November 2006)*. To prevent struggling writers from becoming overwhelmed by teacher proofreading corrections, focus on only 1 or 2 proofreading areas when correcting a writing assignment. Create a student 'writing skills checklist' that inventories key writing competencies (e.g., grammar/syntax, spelling, vocabulary, etc.). For each writing assignment, announce to students that you will grade the assignment for overall content but will make proofreading corrections on only 1-2 areas chosen from the writing skills checklist. (Select different proofreading targets for each assignment matched to common writing weaknesses in your classroom.) Also, to prevent cluttering the student's paper with potentially discouraging teacher comments and editing marks, underline problems in the student' text with a highlighter and number the highlighted errors sequentially at the left margin of the student paper. Then (if necessary) write teacher comments on a separate feedback sheet to explain the writing errors. (Identify each comment with the matching error-number from the left margin of the student's worksheet.) With fewer proofreading comments, the student can better attend to the teacher feedback. Also, even a heavily edited student assignment looks neat and tidy when teachers use the highlighting/numbering technique—preventing students from becoming disheartened at the site of an assignment scribbled over with corrective comments.

Spelling: Leverage the Power of Memory Through Cover-Copy-Compare *(Murphy, Hern, Williams, & McLaughlin, 1990)*. 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.

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Sentence Combining: Teaching Rules of Sentence Structure by Doing

Students with poor writing skills often write sentences that lack 'syntactic maturity' (Robinson & Howell, 2008). That is, these writers' sentences often follow a simple, stereotyped format. In public schools, grammar skills have traditionally been taught in isolation to give students the advanced writing knowledge required to master a diverse range of sentence structures. However, isolated grammar instruction appears to have little or no positive impact in helping poor writers become better writers (Graham & Perin, 2007). A promising alternative is to use sentence combining (Graham & Perin, 2007; Strong, 1986). In this approach, students are presented with kernel sentences and given explicit instruction in how to weld these kernel sentences into more diverse sentence types either by using connecting words to combine multiple sentences into one or by isolating key information from an otherwise superfluous sentence and embedding that important information into the base sentence.

In a simple demonstration of sentence combining, a student may generate these two sentences in her composition on the American Revolution: *The American army had few supplies in the winter of 1776. The American army had few trained military leaders.*

The instructor might meet with the student and have the student recopy the two sentences in this format:

> The American army had few supplies in the winter of 1776.
> The American army had few trained military leaders. (and)

The student would be encouraged to combine the two shorter sentences into a more comprehensive sentence by using the connecting word (coordinating conjunction) '*and*' to combine objects: *The American army had few supplies and few trained military leaders in the winter of 1776.*

Formatting Sentence Combining Examples

These simple formatting conventions are used in sentence-combining exercises (Saddler, 2005; Strong, 1986):

- In each example, the base clause (sentence) appears first. Any sentence(s) to be combined or embedded with the base clause appear below that base clause.

  Example: **Base clause**: The dog ran after the bus.
  Sentence to be embedded: The dog is <u>yellow</u>.
  Student-Generated Solution: *The yellow dog ran after the bus.*

- 'Connecting words' to be used as a sentence-combining tool appear in parentheses at the end of a sentence that is to be combined with the base clause.

  Example: **Base clause**: The car stalled.
  Sentence to be combined: The car ran out of gas. (because)
  Student-Generated Solution: *The car stalled because it ran out of gas.*

- The element(s) of any sentence to be embedded in the base clause are underlined.

Example: **Base clause:** The economic forecast resulted in strong stock market gains.
Sentence to be embedded: The economic forecast was upbeat.
Student-Generated Solution: *The upbeat economic forecast resulted in strong stock market gains.*

Using Sentence Combining in Instruction

Teachers who use sentence combining in their writing instruction should follow a direct-instruction approach (Saddler, 2005). The instructor fosters a learning atmosphere that encourages students to take risks when participating in sentence-combining activities. When first introducing sentence-combining to the class, the instructor explains that using varied sentence structures helps writers to better convey meaning. The instructor tells students that there are often multiple correct ways to combine sentences. The instructor completes several sentence-combining examples in front of the group, using a think-aloud approach to show his or her thinking process in successfully combining sentences. Students should then complete sentence-combining examples in pairs or groups, with the instructor circulating through the class to check for student understanding. Eventually, students work independently on sentence combining tasks to demonstrate mastery. They may then be asked to look in their own writing for examples in which they could combine sentences to improve

A listing of types and examples of sentence-combining appears below in Table 1. When creating lessons on sentence combining, instructors should review the potential types of sentence-combining in Table 1 and decide the order in which those types might be presented to their class.

Table 1: Sentence-combining types and examples (Saddler, 2005; Strong, 1986)

Type of Sentence	Sentence Combining Example
Multiple (Compound) Sentence Subjects or Objects: Two or more subjects can be combined with a conjunction (e.g., *or*, *and*). Two or more direct or indirect objects can be combined with a conjunction (e.g., *or*, *and*).	• Skyscrapers in the city were damaged in the hurricane. Bridges in the city were damaged in the hurricane. *Skyscrapers and bridges in the city were damaged in the hurricane.* • When they travel, migratory birds need safe habitat. When they travel, migratory birds need regular supplies of food. *When they travel, migratory birds need safe habitat and regular supplies of food.*
Adjectives & Adverbs: When a sentence simply contains an adjective or adverb that modifies the noun or verb of another sentence, the adjective or adverb from the first sentence can be embedded in the related sentence.	• Dry regions are at risk for chronic water shortages. Overpopulated regions are at risk for chronic water shortages. *Dry and overpopulated regions are at risk for chronic water shortages.* • Health care costs have risen nationwide. Those health care costs have risen quickly. *Health care costs have risen quickly nationwide.*

Connecting Words: One or more sentences are combined with connecting words. Coordinating conjunctions (e.g., *and, but*) link sentences on an equal basis. Subordinating conjunctions (e.g., *after, until, unless, before, while, because*) link sentences with one of the sentences subordinate or dependent on the other.	• The house was falling apart. No one seemed to care. (but) *The house was falling apart, but no one seemed to care.* • The glaciers began to melt. The earth's average temperature increased. (because) *The glaciers began to melt because the earth's average temperature increased.*
Relative Clauses: Sentence contains an embedded, subordinate clause that modifies a noun.	• The artist was the most popular in the city. The artist painted watercolors of sunsets. (who) *The artist who painted watercolors of sunsets was the most popular in the city.*
Appositives: Sentence contains two noun phrases that refer to the same object. When two sentences refer to the same noun, one sentence be reduced to an appositive and embedded in the other sentence.	• The explorer paddled the kayak across the raging river. The explorer was <u>an expert in handling boats</u>. *The explorer, an expert in handling boats, paddled the kayak across the raging river.*
Possessive Nouns: A sentence that describes possession or ownership can be reduced to a possessive noun and embedded in another sentence.	• Some historians view the Louisiana Purchase as the most important expansion of United States territory. The Louisiana Purchase was <u>President Jefferson's</u> achievement. *Some historians view President Jefferson's Louisiana Purchase as the most important expansion of United States territory.*

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Proofreading: Comments Sheet

Writer: ____ Date _______________

Proofreader: ____

Targeted Area(s) for Proofreading: ____

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Comment #	Comment
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'Academic Enabler' Observational Checklists: Measuring Students' Ability to Manage Their Own Learning

Student academic success requires more than content knowledge or mastery of a collection of cognitive strategies. Academic accomplishment depends also on a set of ancillary skills and attributes called 'academic enablers' (DiPerna, 2006). Examples of academic enablers include:

- Study skills
- Homework completion
- Cooperative learning skills
- Organization
- Independent seatwork

Because academic enablers are often described as broad skill sets, however, they can be challenging to define in clear, specific, measureable terms. A useful method for defining a global academic enabling skill is to break it down into a checklist of component sub-skills--a process known as 'discrete categorization' (Kazdin, 1989). An observer can then use the checklist to note whether a student successfully displays each of the sub-skills.

Observational checklists that define academic enabling skills have several uses in Response to Intervention:

- Classroom teachers can use these skills checklists as convenient tools to assess whether a student possesses the minimum 'starter set' of academic enabling skills needed for classroom success.

- Teachers or tutors can share examples of academic-enabler skills checklists with students, training them in each of the sub-skills and encouraging them to use the checklists independently to take greater responsibility for their own learning.

- Teachers or other observers can use the academic enabler checklists periodically to monitor student progress during interventions--assessing formatively whether the student is using more of the sub-skills.

A collection of the most common global 'academic enabler' skills in ready-made checklist format appear below.

Study Skills. The student:				
❑ takes complete, organized class notes in legible form and maintains them in one accessible note book	Poor Fair 1 2	Good 3	NA –
❑ reviews class notes frequently (e.g., after each class) to ensure understanding	Poor Fair 1 2	Good 3	NA –
❑ When reviewing notes, uses highlighters, margin notes, or other strategies to note questions or areas of confusion for later review with teacher or tutor	Poor Fair 1 2	Good 3	NA –
❑ follows an efficient strategy to study for tests and quizzes	Poor Fair 1 2	Good 3	NA –
❑ allocates enough time to study for tests and quizzes	Poor Fair 1 2	Good 3	NA –
❑ is willing to seek help from the teacher to answer questions or clear up areas of confusion	Poor Fair 1 2	Good 3	NA –
❑ Other: ____			
Comments: ____ ____			

Organization Skills. The student:			
❑ arrives to class on time.	Poor Fair 1 2	Good 3	NA –
❑ maintains organization of locker to allow student to efficiently store and retrieve needed books, assignments, work materials, and personal belongings	Poor Fair 1 2	Good 3	NA –
❑ maintains organization of backpack or book bag to allow student to efficiently store and retrieve needed books, assignments, work materials, and personal belongings	Poor Fair 1 2	Good 3	NA –
❑ brings to class the necessary work materials expected for the course (e.g., pen, paper, calculator, etc.)	Poor Fair 1 2	Good 3	NA –
❑ is efficient in switching work materials when transitioning from one in-class learning activity to another	Poor Fair 1 2	Good 3	NA –
❑ Other: ____	Poor Fair 1 2	Good 3	NA –
Comments: ____ ____			

Homework Completion. The student:	
❑ writes down homework assignments accurately and completely	Poor Fair Good NA 1 2 3 –
❑ makes use of available time in school (e.g., study halls, homeroom) to work on homework	Poor Fair Good NA 1 2 3 –
❑ has an organized, non-distracting workspace available at home to do homework	Poor Fair Good NA 1 2 3 –
❑ creates a work plan before starting homework (e.g., sequencing the order in which assignments are to be completed; selecting the most challenging assignment to start first when energy and concentration are highest)	Poor Fair Good NA 1 2 3 –
❑ when completing homework, uses highlighters, margin notes, or other strategies to note questions or areas of confusion for later review with teacher or tutor	Poor Fair Good NA 1 2 3 –
❑ turns in homework on time	Poor Fair Good NA 1 2 3 –
❑ Other: ________________________________	Poor Fair Good NA 1 2 3 –
Comments: ________________________________ ________________________________	

Cooperative Learning Skills. The student:	
❑ participates in class discussion	Poor Fair Good NA 1 2 3 –
❑ gets along with others during group/pair activities	Poor Fair Good NA 1 2 3 –
❑ participates fully in group/pair activities	Poor Fair Good NA 1 2 3 –
❑ does his or her 'fair share' of work during group/pair activities	Poor Fair Good NA 1 2 3 –
❑ is willing to take a leadership position during group/pair activities	Poor Fair Good NA 1 2 3 –
❑ Other: ________________________________	Poor Fair Good NA 1 2 3 –
Comments: ________________________________ ________________________________	

Independent Seat Work. The student:	
❑ has necessary work materials for the assignment	Poor Fair 1 2 Good 3 NA –
❑ is on-task during the assignment at a level typical for students in the class	Poor Fair 1 2 Good 3 NA –
❑ refrains from distracting behaviors (e.g., talking with peers without permission, pen tapping, vocalizations such as loud sighs or mumbling, etc.)	Poor Fair 1 2 Good 3 NA –
❑ recognizes when he or she needs teacher assistance and is willing to that assistance	Poor Fair 1 2 Good 3 NA –
❑ requests teacher assistance in an appropriate manner	Poor Fair 1 2 Good 3 NA –
❑ requests assistance from the teacher only when really needed	Poor Fair 1 2 Good 3 NA –
❑ if finished with the independent assignment before time expires, uses remaining time to check work or engage in other academic activity allowed by teacher	Poor Fair 1 2 Good 3 NA –
❑ takes care in completing work—as evidenced by the quality of the finished assignment	Poor Fair 1 2 Good 3 NA –
❑ is reliable in turning in in-class assignments	Poor Fair 1 2 Good 3 NA –
❑ Other: ______________________________	Poor Fair 1 2 Good 3 NA –
Comments: ______________________________ ______________________________	

Motivation. The student:	
❑ has a positive sense of 'self-efficacy' about the academic content area (self-efficacy can be defined as the confidence that one can be successful in the academic discipline or subject matter if one puts forth reasonable effort)	Poor Fair 1 2 Good 3 NA –
❑ displays some apparent *intrinsic* motivation to engage in course work (e.g., is motivated by topics and subject matter discussed or covered in the course; finds the act of working on course assignments to be reinforcing in its own right)	Poor Fair 1 2 Good 3 NA –
❑ displays apparent *extrinsic* motivation to engage in course work (e.g., is motivated by grades, praise, public recognition of achievement, access to privileges such as sports eligibility, or other rewarding outcomes)	Poor Fair 1 2 Good 3 NA –
❑ Other: ______________________________	Poor Fair 1 2 Good 3 NA –

Comments:

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