



RTI Toolkit: A Practical Guide for Schools

RTI: General Academic Interventions for Difficult-to-Teach Students

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Tier I (Classroom) Intervention Planner

Teacher/Team: _____ Date: _____ Student: _____

Student Concern #1: _____

Student Concern #2: _____

[Optional] Person(s) assisting with intervention planning process: _____

Intervention Description	Intervention Delivery	Progress-Monitoring Data	Check-Up Date
Describe each intervention that you plan to use to address the student's concern(s).	List key details about delivery of the intervention, such as: (1) where & when the intervention will be used; (2) the adult-to-student ratio; (3) how frequently the intervention will take place; (4) the length of time each session of the intervention will last.	Note what classroom data will be used to demonstrate the student's progress during this intervention.	Select a date when the data will be reviewed to evaluate the intervention.

Intervention Script Builder for: Student Name: _____ Grade: _____

Teacher/Team: _____ Intervention Start Date: ____/____/____

Description of the Target Academic or Behavior Concern: _____

Intervention Check	Intervention Preparation Steps: Describe any preparation (creation or purchase of materials, staff training, etc.) required for this intervention.	Person(s) Responsible
This step took place Y__ N__	1. _____	
This step took place Y__ N__	2. _____	
This step took place Y__ N__	3. _____	

Intervention Check	Intervention Steps: Describe the steps of the intervention. Include enough detail so that the procedures are clear to all who must implement them.	Person(s) Responsible
This step took place Y__ N__	1. _____ _____	
This step took place Y__ N__	2. _____ _____	
This step took place Y__ N__	3. _____ _____	
This step took place Y__ N__	4. _____ _____	
This step took place Y__ N__	5. _____ _____	
This step took place Y__ N__	6. _____ _____	

Research Citation(s) / References: List the published source(s) that make this a 'scientifically based' intervention.

Intervention Quality Check: How will data be collected to verify that this intervention is put into practice as it was designed? (Select at least one option.)

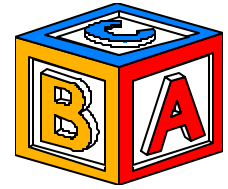
- Classroom Observation: Number of observations planned? _____
Person responsible for observations?: _____
- Teacher Intervention Rating Log: How frequently will the teacher rate intervention follow-through?
Daily___ Weekly ___
- Teacher Verbal Report: Who will check in with the teacher for a verbal report of how the intervention is progressing? _____
Approximately when during the intervention period will this verbal 'check in' occur? _____
- Rating Intervention Follow-Through: Select either the classroom teacher/team or an outside observer to rate the quality of the intervention and check the appropriate set of directions below.

___ *Teacher Directions:* Make copies of this intervention script. Once per week, review the steps in the intervention script and note (Y/N) whether each step was *typically* followed. Then write any additional notes about the intervention in the blank below

___ *Independent Observer Directions:* Make copies of this intervention script. At several points during the intervention, make an appointment to observe the intervention in action. While observing the intervention, go through the steps in the intervention script and note (Y/N) whether each step was typically followed. Then write any additional notes about the intervention in the space below

Intervention Observation Notes: _____

Building Blocks of Effective Instruction



Good classroom instruction is no accident. Two powerful tools for analyzing the quality of student instruction are the *Instructional Hierarchy* and the *Learn Unit*.

Instructional Hierarchy. As students are taught new academic skills, they go through a series of predictable learning stages. At the start, a student is usually halting and uncertain as he or she tries to use the target skill. With teacher feedback and lots of practice, the student becomes more fluent, accurate, and confident in using the skill. It can be very useful to think of these phases of learning as a *hierarchy* (See chart on page 2). The learning hierarchy (Haring, Lovitt, Eaton, & Hansen, 1978) has four stages: *acquisition*, *fluency*, *generalization*, and *adaptation*:

1. **Acquisition.** The student has begun to learn how to complete the target skill correctly but is not yet accurate or fluent in the skill. The goal in this phase is to improve accuracy.
2. **Fluency.** The student is able to complete the target skill accurately but works slowly. The goal of this phase is to increase the student's speed of responding (fluency).
3. **Generalization.** The student is accurate and fluent in using the target skill but does not typically use it in different situations or settings. Or the student may confuse the target skill with 'similar' skills. The goal of this phase is to get the student to use the skill in the widest possible range of settings and situations, or to accurately discriminate between the target skill and 'similar' skills.
4. **Adaptation.** The student is accurate and fluent in using the skill. He or she also uses the skill in many situations or settings. However, the student is not yet able to modify or adapt the skill to fit novel task-demands or situations.

The 'Learn Unit'. At the core of good instruction lies the "Learn Unit", a 3-step process in which the student is invited to engage in an academic task, delivers a response, and then receives immediate feedback about how he or she did on the task (Heward, 1996). Here is an explanation of the stages of the 'Learn Unit':

1. **Academic Opportunity to Respond.** The student is presented with a meaningful opportunity to respond to an academic task. A question posed by the teacher, a math word problem, and a spelling item on an educational computer 'Word Gobbler' game could all be considered academic opportunities to respond.
2. **Active Student Response.** The student answers the item, solves the problem presented, or completes the academic task. Answering the teacher's question, computing the answer to a math word problem (and showing all work), and typing in the correct spelling of an item when playing an educational computer game are all examples of active student responding.
3. **Performance Feedback.** The student receives timely feedback about whether his or her response is correct—often with praise and encouragement. A teacher exclaiming 'Right! Good job!' when a student gives an response in class, a student using an answer key to check her answer to a math word problem, and a computer message that says 'Congratulations! You get 2 points for correctly spelling this word!' are all examples of corrective feedback.

The more frequently a student cycles through complete 'Learn Unit' trials, the faster that student is likely to make learning progress. If any one of these steps is missing, the quality of instruction will probably be compromised.

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 Co.

Heward, W.L. (1996). Three low-tech strategies for increasing the frequency of active student response during group instruction. In R.Gardner, D.M.Sainato, J.O.Cooper, T.E.Heron, W.L.Heward, J.W.Eshleman, & T.A.Grossi (Eds.), *Behavior analysis in education: Focus on measurably superior instruction* (pp.283-320). Pacific Grove, CA: Brooks/Cole.

Instructional Hierarchy: Matching Interventions to Student Learning Stage (Haring, et al., 1978)

<i>Learning Stage</i>	<i>Student 'Look-Fors'...</i>	<i>What strategies are effective...</i>
<p>Acquisition: Exit Goal: The student can perform the skill accurately with little adult support.</p>	<ul style="list-style-type: none"> • Is just beginning to learn skill • Not yet able to perform learning task reliably or with high level of accuracy 	<ul style="list-style-type: none"> • Teacher actively demonstrates target skill • Teacher uses 'think-aloud' strategy-- especially for thinking skills that are otherwise covert • Student has models of correct performance to consult as needed (e.g., correctly completed math problems on board) • Student gets feedback about correct performance • Student receives praise, encouragement for <i>effort</i>
<p>Fluency: Exit Goals: The student (a) has learned skill well enough to retain (b) has learned skill well enough to combine with other skills, (c) is as fluent as peers.</p>	<ul style="list-style-type: none"> • Gives accurate responses to learning task • Performs learning task slowly, haltingly 	<ul style="list-style-type: none"> • Teacher structures learning activities to give student opportunity for active (observable) responding • Student has frequent opportunities to <i>drill</i> (direct repetition of target skill) and <i>practice</i> (blending target skill with other skills to solve problems) • Student gets feedback on <i>fluency</i> and <i>accuracy</i> of performance • Student receives praise, encouragement for <i>increased fluency</i>
<p>Generalization: Exit Goals: The student (a) uses the skill across settings, situations; (b) does not confuse target skill with similar skills</p>	<ul style="list-style-type: none"> • Is accurate and fluent in responding • May fail to apply skill to new situations, settings • May confuse target skill with similar skills (e.g., confusing '+' and 'x' number operation signs) 	<ul style="list-style-type: none"> • Teacher structures academic tasks to require that the student use the target skill regularly in assignments. • Student receives encouragement, praise, reinforcers for using skill in new settings, situations • If student confuses target skill with similar skill(s), the student is given practice items that force him/her to correctly discriminate between similar skills • Teacher works with parents to identify tasks that the student can do outside of school to practice target skill • Student gets periodic opportunities to review, practice target skill to ensure maintenance
<p>Adaptation: Exit Goal: The Adaptation phase is continuous and has no exit criteria.</p>	<ul style="list-style-type: none"> • Is fluent and accurate in skill • Applies skill in novel situations, settings without prompting • Does not yet modify skill as needed to fit new situations (e.g., child says 'Thank you' in all situations, does not use modified, equivalent phrases such as "I appreciate your help.") 	<ul style="list-style-type: none"> • Teacher helps student to articulate the '<i>big ideas</i>' or core element(s) of target skill that the student can modify to face novel tasks, situations (e.g., fractions, ratios, and percentages link to the 'big idea' of <i>the part in relation to the whole</i>; 'Thank you' is part of a larger class of <i>polite speech</i>) • Train for adaptation: Student gets opportunities to practice the target skill with modest modifications in new situations, settings with encouragement, corrective feedback, praise, other reinforcers. • Encourage student to set own goals for adapting skill to new and challenging situations.

Increasing the Intensity of an Intervention: Key Dimensions

Interventions can move up the RTI Tiers through being intensified across several dimensions, including:

- Student-teacher ratio
- Length of intervention sessions
- Frequency of intervention sessions
- Duration of the intervention period (e.g., extending an intervention from 5 weeks to 10 weeks)
- Type of intervention strategy or materials used
- Motivation strategies

References

Burns, M. K., & Gibbons, K. A. (2008). *Implementing response-to-intervention in elementary and secondary schools*. Routledge: New York.

Kratochwill, T. R., Clements, M. A., & Kalymon, K. M. (2007). Response to intervention: Conceptual and methodological issues in implementation. In Jimerson, S. R., Burns, M. K., & VanDerHeyden, A. M. (Eds.), *Handbook of response to intervention: The science and practice of assessment and intervention*. New York: Springer.

Research-Based Elements of Effective Interventions

Teachers can have confidence in any classroom intervention by checking to see that it contains these key evidence-based elements:

- **'Correctly targeted'**: The intervention is appropriately matched to the student's academic or behavioral needs.
- **'Explicit instruction'**: Student skills have been broken down "into manageable and deliberately sequenced steps and providing overt strategies for students to learn and practice new skills" p.1153
- **'Appropriate level of challenge'**: The student experiences adequate success with the instructional task.
- **'High opportunity to respond'**: The student actively responds at a rate frequent enough to promote effective learning.
- **'Feedback'**: The student receives prompt performance feedback about the work completed.

Source: Burns, M. K., VanDerHeyden, A. M., & Boice, C. H. (2008). Best practices in intensive academic interventions. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology V* (pp.1151-1162). Bethesda, MD: National Association of School Psychologists.

Interventions, Accommodations, and Modifications: Definitions

Interventions. An academic *intervention* is a strategy used to teach a new skill, build fluency in a skill, or encourage a child to apply an existing skill to new situations or settings.

An intervention is said to be research-based when it has been demonstrated to be effective in one or more articles published in peer-reviewed scientific journals. Interventions might be based on commercial programs such as Read Naturally. The school may also develop and implement an intervention that is based on guidelines provided in research articles—such as Paired Reading (Topping, 1987).

Accommodations. An *accommodation* is intended to help the student to fully access the general-education curriculum **without changing** the instructional content. An accommodation for students who are slow readers, for example, may include having them supplement their silent reading of a novel by listening to the book on tape.

An accommodation is intended to remove barriers to learning while still expecting that students will master the same instructional content as their typical peers. Informal accommodations may be used at the classroom level or be incorporated into a more intensive, individualized intervention plan.

Modifications. A *modification* changes the expectations of what a student is expected to know or do—typically by lowering the academic expectations against which the student is to be evaluated.

Examples of modifications are reducing the number of multiple-choice items in a test from five to four or shortening a spelling list. Under RTI, modifications are generally not included in a student's intervention plan, because the working assumption is that the student can be successful in the curriculum with appropriate interventions and accommodations alone.

Reading Interventions

School-Wide Strategies for Managing...

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, Bokseveld, 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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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.

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Reading Comprehension: “Click or Clunk?” A Student Comprehension Self-Check

Description: 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.

Intervention Script:

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.)

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

Tips:

Create Silent “Click/Clunk” Signals. Although it may seem rather silly to have students call out “Click” and “Clunk” as an aid to monitor their own reading, the technique is actually quite valuable. When students must make regular summary judgments about how well they comprehend at the sentence level, they are more likely to recognize—and to resolve—comprehension errors as these mistakes arise.

You might find, however, that students start to distract each other as they call out these comprehension signals. Once you see that students consistently use the technique, you can train them to softly whisper the signal. Or confer with your students to come up with an unobtrusive non-verbal signal (e.g., lightly tapping the desk once for “Click” and twice for “Clunk”) that is obvious enough to allow you to monitor readers’ use of the technique without distracting other students.

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MY READING CHECK SHEET*

Name: _____ Class: _____



Sentence Check... "Did I understand this sentence?"

If you had trouble understanding a word in the sentence, try...

- Reading the sentence over.
- Reading the next sentence.
- Looking up the word in the glossary (if the book or article has one).
- Asking someone.

If you had trouble understanding the meaning of the sentence, try...

- Reading the sentence over.
- Reading the whole paragraph again.
- Reading on.
- Asking someone.



Paragraph Check... "What did the paragraph say?"

If you had trouble understanding what the paragraph said, try...

- Reading the paragraph over.



Page Check... "What do I remember?"

If you had trouble remembering what was said on this page, try...

- Re-reading each paragraph on the page, and asking yourself, "What did it say?"

*Adapted from Anderson (1980), Babbs (1984)

Math Interventions

School-Wide Strategies for Managing...

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).

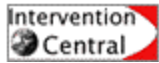
Math Review: Teach Effective Test-Preparation Strategies (Hong, Sas, & Sas, 2006). A comparison of the methods that high and low-achieving math students typically use to prepare for tests suggests that struggling math students need to be taught (1) specific test-review strategies and (2) time-management 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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Cover-Copy-Compare

[Visit the Math Computation Sheet Generator to Create Math Worksheets In CCC Format](#)

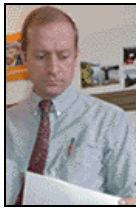
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Students who can be trusted to work independently and need extra drill and practice with math computational problems, spelling, or vocabulary words will benefit from Cover-Copy-Compare.

Jim's Hints for Using...

Cover-Copy-Compare



When using CCC worksheets, add an occasional item (e.g., vocabulary word, math problem) that the student has already mastered. These review items are great for refreshing student skills on learned material and can also give the teacher an indication of how well the student is retaining academic skills.

You can boost student motivation by praising the student for his or her efforts in completing the worksheets. You might also want to have the student build a portfolio of completed CCC worksheets. In reviewing this portfolio of work periodically, the student can see tangible evidence of improvement in his or her academic skills.

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:

$\begin{array}{r} 49 \\ 88 \overline{)4312} \\ \underline{-352} \\ 792 \\ \underline{-792} \\ 0 \end{array}$		$88 \overline{)4312}$
--------------------------------------------------------------------------------------------------------------	--	-----------------------

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.

Troubleshooting: How to Deal With Common Problems in Using 'Cover-Copy-Compare'

Q: *How do I respond if the student simply copies the correct answers from the models into the answer blanks and tries to pass this off as his or her own work?*

An essential requirement of Cover-Copy-Compare is that the student cover the correct model and attempt independently to solve the item using his or her own skills. If the student simply copies the correct answer from the model math problem or spelling word, the review process is short-circuited and the student will not benefit. If you suspect a student will copy rather than attempt to solve items on a CCC worksheet, arrange to have a peer tutor, adult in the classroom, or parent sit with the student to provide encouragement and monitoring.

Q: *I have a student who is so disorganized that he will lose the index card before he can complete a CCC worksheet. Any suggestions?*

Here is an idea for getting rid of that index card: You can fold the worksheet in half length-wise so that the answers appear on one side of the folded worksheet and the answer blanks appear on the other side. For each item, the student will peer at the correct model, then flip the folded sheet over to the right side to independently solve the item (with the correct model neatly folded out of sight).

Math Review: Promote Mastery of Math Facts Through Incremental Rehearsal



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 repeated, or massed, practice to promote fluency and guarantees that the student will experience a high rate of success..

Materials

- Index cards and 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, an 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 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.

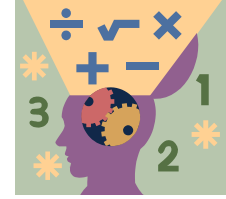
3. The tutor then repeats the sequence--taking yet another problem from the 'known facts' deck to add to the expanding collection of math facts being reviewed ('review deck'). Each time, the tutor prompts the student to read off and answer the whole series of math facts in the review deck, beginning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

Reference

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.

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 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/htmldocs/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.

Reference

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.

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



Students must be able to correctly interpret math graphics in order to correctly answer many applied math problems. Struggling learners in math often misread or misinterpret math graphics. For example, students may:

- overlook important details of the math graphic.
- treat irrelevant data on the math graphic as 'relevant'.
- fail to pay close attention to the question before turning to the math graphic to find the answer
- not engage their prior knowledge both to extend the information on the math graphic and to act as a possible 'reality check' on the data that it presents.
- expect the answer to be displayed in plain sight on the math graphic, when in fact the graphic may require that readers first to interpret the data, then to plug the data into an equation to solve the problem.

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.

Steps to Implementing This Intervention

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

1. Step 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 a Question-Answer Relationship that matches the question in the applied problem
- ✓ 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.

Math Computation: Increase Accuracy and Productivity Rates Via Self-Monitoring and Performance Feedback



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/htmldocs/tools/mathprobe/addsing.php>)
- Student self-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 his or her 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, 22*, 397-414.

Activity: Evaluate Your Student Population's Profile of Math Proficiency...

Directions: As a group, review the National Research Council 'Strands of Math Proficiency'.

In which strand do you feel that your school / curriculum does the best job of helping students to attain proficiency?

Which strand do you feel that your school / curriculum should put the greatest effort to figure out how to help students to attain proficiency? Be prepared to share your results.

1. Understanding: Comprehending mathematical concepts, operations, and relations--knowing what mathematical symbols, diagrams, and procedures mean.
2. Computing: Carrying out mathematical procedures, such as adding, subtracting, multiplying, and dividing numbers flexibly, accurately, efficiently, and appropriately.
3. Applying: Being able to formulate problems mathematically and to devise strategies for solving them using concepts and procedures appropriately.
4. Reasoning: Using logic to explain and justify a solution to a problem or to extend from something known to something less known.
5. Engaging: Seeing mathematics as sensible, useful, and doable—if you work at it—and being willing to do the work.

Reference

National Research Council. (2002). Helping children learn mathematics. Mathematics Learning Study Committee, J. Kilpatrick & J. Swafford, Editors, Center for Education, Division of Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

Writing Interventions

Writing Skills Checklist

Directions: Use this checklist to inventory students' foundation writing skills. Any writing skill that is marked 'N[o]' should be targeted for intervention.

Problem?	Writing Competency	Sample Intervention Ideas
Physical Production of Writing		
__Y __N	<i>Writing Speed.</i> Writes words on the page at a rate equal or nearly equal to that of classmates	<ul style="list-style-type: none"> • Teach keyboarding skills • Allow student to dictate ideas into a tape-recorder and have a volunteer (e.g., classmate, parent, school personnel) transcribe them
__Y __N	<i>Handwriting.</i> Handwriting is legible to most readers	<ul style="list-style-type: none"> • Provide training in handwriting • Teach keyboarding skills
Mechanics & Conventions of Writing		
__Y __N	<i>Grammar & Syntax.</i> Knowledge of grammar (rules governing use of language) and syntax (grammatical arrangement of words in sentences) is appropriate for age and/or grade placement	<ul style="list-style-type: none"> • Teach rules of grammar, syntax • Have students compile individualized checklists of their own common grammar/syntax mistakes; direct students to use the checklist to review work for errors before turning in
__Y __N	<i>Spelling.</i> Spelling skills are appropriate for age and/or grade placement	<ul style="list-style-type: none"> • Have student collect list of own common misspellings; assign words from list to study; quiz student on list items • Have student type assignments and use spell-check
Writing Content		
__Y __N	<i>Vocabulary.</i> Vocabulary in written work is age/grade appropriate	<ul style="list-style-type: none"> • Compile list of key vocabulary and related definitions for subject area; assign words from list to study; quiz student on definitions of list items • Introduce new vocabulary items regularly to class; set up cooperative learning activities for students to review vocabulary
__Y __N	<i>Word Choice.</i> Distinguishes word-choices that are appropriate for informal (colloquial, slang) written discourse vs. formal discourse	<ul style="list-style-type: none"> • Present examples to the class of formal vs. informal word choices • Have students check work for appropriate word choice as part of writing revision process
__Y __N	<i>Audience.</i> Identifies targeted audience for writing assignments and alters written content to match needs of projected audience	<ul style="list-style-type: none"> • Direct students to write a 'targeted audience profile' as a formal (early) step in the writing process; have students evaluate the final writing product to needs of targeted audience during the revision process
__Y __N	<i>Plagiarism.</i> Identifies when to credit authors for use of excerpts quoted verbatim or unique ideas taken from other written works	<ul style="list-style-type: none"> • Define plagiarism for students. Use plentiful examples to show students acceptable vs. unacceptable incorporation of others' words or ideas into written compositions

Writing Preparation		
___Y ___N	<i>Topic Selection.</i> Independently selects appropriate topics for writing assignments	<ul style="list-style-type: none"> Have student generate list of general topics that that interest him or her; sit with the student to brainstorm ideas for writing topics that relate to the student's own areas of interest
___Y ___N	<i>Writing Plan.</i> Creates writing plan by breaking larger writing assignments into sub-tasks (e.g., select topic, collect source documents, take notes from source documents, write outline, etc.)	<ul style="list-style-type: none"> Create generic pre-formatted work plans for writing assignments that break specific types of larger assignments (e.g., research paper) into constituent parts. Have students use these plan outlines as a starting point to making up their own detailed writing plans.
___Y ___N	<i>Note-Taking.</i> Researches topics by writing notes that capture key ideas from source material	<ul style="list-style-type: none"> Teach note-taking skills; have students review note-cards with the teacher as quality check.
Writing Production & Revision		
___Y ___N	<i>Adequate 'Seat Time'.</i> Allocates realistic amount of time to the act of writing to ensure a quality final product	<ul style="list-style-type: none"> Use teacher's experience and information from proficient student writers to develop estimates of minimum writing 'seat time' needed to produce quality products for 'typical' writing assignments (e.g., 5-paragraph opinion essay; 10-page term paper). Share with students. Have students keep a writing diary to record amount of time spent in act of writing for each assignment. Require that this information be submitted along with the students' assignment. (Additional idea: Consider asking parents to monitor and record their child's writing time.)
___Y ___N	<i>Oral vs. Written Work.</i> Student's dictated and written passages are equivalent in complexity and quality	<ul style="list-style-type: none"> Allow student to dictate ideas into a tape-recorder and have a volunteer (e.g., classmate, parent, school personnel) transcribe them Permit the student to use speech-to-text software (e.g., Dragon Naturally Speaking) to dictate first drafts of writing assignments.
___Y ___N	<i>Revision Process.</i> Revises initial written draft before turning in for a grade or evaluation	<ul style="list-style-type: none"> Create a rubric containing the elements of writing that students should review during the revision process; teach this rubric to the class; link a portion of the grade on writing assignments to students' use of the revision rubric.
___Y ___N	<i>Timely Submission.</i> Turns in written assignments (class work, homework) on time	<ul style="list-style-type: none"> Provide student incentives for turning work in on time. Work with parents to develop home-based plans for work completion and submission. Institute school-home communication to let parents know immediately when important assignments are late or missing.

School-Wide Strategies for Managing... WRITING

A service of www.interventioncentral.org

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's 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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Integrated Writing Instruction

Students with writing disabilities typically find the act of writing to be both difficult and unrewarding. These students' resulting lack of motivation to write can lock them into a downward spiral, in which they avoid most writing tasks and fail to develop those writing skills in which they are deficient. Indeed, for some students, a diagnosed writing disability may not be neurologically based but instead can be explained by the student's simple lack of opportunities to practice and build competent writing skills.

MacArthur and colleagues (MacArthur, Graham, & Schwartz, 1993) have developed an integrated approach to classroom writing instruction designed to accommodate the special needs of disabled writers, as well as those of their non-disabled peers. In this instructional approach, the student writes about authentic topics that have a 'real-world' purpose and relevance. Student writing is regularly shared with classmates and the instructor, with these audiences creating a sustaining social context to motivate and support the writer. Students receive instruction and feedback in an interactive manner, presented both in lecture format and through writing conferences with classmates. Technology (particularly computer word processing) is harnessed to help the writing disabled student to be more productive and to make use of software writing tools to extend his or her own capabilities in written expression.

The instructor follows a uniform daily instructional framework for writing instruction. First, the instructor checks in with students about the status of their current writing projects, then teaches a mini-lesson, next allows the group time to write and to conference with peers and the teacher, and finally arranges for the group to share or publish their work for a larger audience.

Status-checking. At the start of the writing session, the instructor quickly goes around the room, asking each student what writing goal(s) he or she plans to accomplish that day. The instructor records these responses for all to see.

Mini-Lesson. The instructor teaches a mini-lesson relevant to the writing process. Mini-lessons are a useful means to present explicit writing strategies (e.g., an outline for drafting an opinion essay), as well as a forum for reviewing the conventions of writing. Mini-lessons should be kept short (e.g., 5-10 minutes) to hold the attention of the class.

Student Writing. During the session, substantial time is set aside for students to write. Their writing assignment might be one handed out by the instructor that day or part of a longer composition (e.g., story, extended essay) that the student is writing and editing across multiple days. When possible, student writers are encouraged use computers as aids in composing and editing their work. (Before students can compose efficiently on computers, of course, they must have been trained in keyboarding and use of word-processing software).

Peer & Teacher Conferences. Writers need timely, gentle, focused feedback from readers of their work in order to improve their compositions. At the end of the daily writing block, the student may sit with a classmate to review each other's work, using a structured peer editing strategy. During this discussion time, the teacher also holds brief individual conferences with students to review

their work, have students evaluate how successfully they completed their writing goals for the day, and hear writers' thoughts about how they might plan to further develop a writing assignment.

Group Sharing or Publishing. At the end of each session, writing produced that day is shared with the whole class. Students might volunteer to read passages aloud from their compositions. Another method of sharing might be for the students to post their work on the classroom wall or bulletin board for everyone to read and respond to. Periodically, polished student work might be displayed in a public area of the school for all to read, published in an anthology of school writings, read aloud at school assemblies, or published on the Internet.

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