Response to Intervention (RtI), English Language Learners, and Math: Building Language Skills in Struggling Learners through the Academic Language of Mathematics

"Response to Intervention (RtI) is a comprehensive early detection and prevention strategy that identifies struggling students and assists them before they fall behind."

—National Center for Education Evaluation (IES), 2008

"Mathematics performance and learning of groups that have traditionally been underrepresented in mathematics fields can be improved by interventions that address social, affective, and motivational factors. Recent research documents that social and intellectual support from peers and teachers is associated with higher mathematics performance for all students, and that such support is especially important for many African-American and Hispanic students."

—National Mathematics Advisory Panel, 2008

"Mathematics and language are inexorably linked."

—T.C. Dale and G.J. Cuevas, 1992

The term RtI, or Response to Intervention, first came into vogue in K–12 public education after the passage of the Individuals with Disabilities Education Act (IDEA) in 2004. As part of our federal education law, RtI was identified as a specific approach school districts could take to adjust classroom instruction, offer specific interventions, and boost overall student achievement, particularly among students designated under IDEA.

Based on more than a century of psychological and education research, in RtI the classroom teacher "modifies instruction (intervention) to help a struggling child, and then checks the child's progress regularly (called progress monitoring) to see if the intervention is working."[1] If the intervention works, the problem is solved. If it does not work, the teacher must change the intervention and continue to monitor student progress. If the student still does not improve, the teacher must apply more intensive and specific interventions to address student learning deficiencies.

[1]Hale, J.B. (2008). *Response to Intervention: Guidelines for Parents and Practitioners*. Wrights Law.

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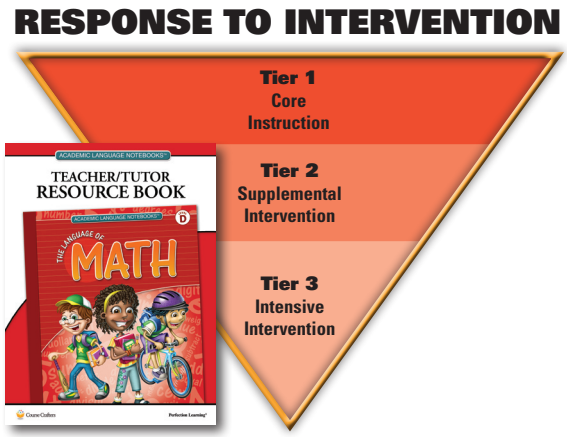
RtI is a powerful tool to help teachers equip students with the literacy and math proficiencies they need to perform at grade level while avoiding tagging students with a specific learning disability, or SLD, label. It recognizes that the vast majority of students (some estimate upwards of 95 percent) are capable of performing at proficient academic levels, thus allowing IDEA programs to specifically target the 5 to 10 percent of the student population that are truly designated SLD.

The RtI approach has been particularly successful in building math and literacy skills among students, providing teachers the instructional knowledge, materials, and support necessary to boost student achievement. In recent years, school districts have also successfully utilized RtI efforts to address the specific learning needs of English Language Learners (ELLs), applying core math and literacy interventions to develop English language proficiency.

RtI and English Language Learners

"Children cannot learn the language they need for academic development on their own. All students need instructional support but especially English Learners."
—Lily Wong Fillmore, 2004



According to the Institute of Education Sciences' 2008 Practice Guide on Response to Intervention (RtI)[2], RtI is typically thought of having three tiers, or levels, of intervention. These tiers include:

- **Tier 1—**Instruction provided to all students in a class.
- **Tier 2—**Interventions provided only to students who demonstrate problems based on screening measures or weak progress from regular classroom instruction.
- **Tier 3—**Interventions provided to students who do not progress after a reasonable amount of time with the Tier 2 intervention and require more intensive assistance.

The value and impact of RtI is particularly acute with English Language Learners, many of whom need specific interventions in both reading and mathematics. According to the U.S. Department of Education, there are five key recommendations for instruction of ELLs. These recommendations provide a basic framework for ELL instruction throughout the United States:

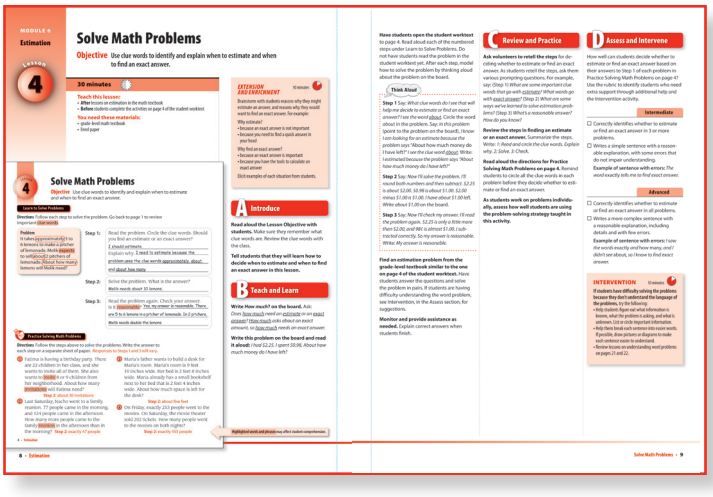
- Screen for problems and monitor progress
- Provide intensive, small-group interventions
- Provide extensive and varied vocabulary instruction
- Develop academic English
- Schedule regular, peer-assisted learning opportunities

Recognizing the math and reading needs of struggling ELL learners, programs such as *Academic Language Notebooks:* The Language of Math (ALN) has applied the above framework to construct effective instructional programs for ELLs, particularly those struggling students in grades three through eight in need of Tier 2 or Tier 3 RtI. Such programs focus on four key principles:

- Teach the essential academic language of mathematics curriculum
- Offer modularized and non-sequential instruction
- Provide educators with the ability to work with varying levels of ELLs
- Establish and measure standards-based objectives of student performance

Applying decades of results on effective mathematics, literacy, and ELL instruction to an RtI infrastructure, *Academic Language Notebooks* provides the Tier 2 and Tier 3 interventions ELLs need to develop reading and math proficiency. Through a modular, non-sequential design that empowers teachers to focus on specific math skills and the academic language that is used to communicate those skills, ALN provides the learning building blocks to move struggling learners to grade level achievement.

Focusing on the Language of Math—Research Based Instruction



[2]Gersten, R., Compton, D., Connor, C.M., Dimino, J., Santoro, L., Linan-Thompson, S. & Tilly, W.D. (2008). Assisting students struggling with reading: *Response to Intervention and multi-tier intervention for reading in the primary grades. A practice guide.* (NCEE 2009-4045). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

"A key question that must be asked is whether or not an assessment measures students' mathematical skills or their proficiency in English…ELLs must process and interpret information in a language in which they are not fully proficient to be able to perform the mathematical tasks."
—Gottlieb, 2007

Research in the fields of ELL instruction, mathematics, and special education highlight the foundational building blocks necessary to effectively teach math to ELLs, particularly those identified as struggling learners. Whether it be computational word problems, fractions, or even algebra, students' understanding and application of the math skill is based on:

- a clear understanding of the topic or main idea;
- acquisition of the vocabulary used in instruction;
- use of more language in the learning process; and
- successful completion of math assignments.

For math instruction, even native English speakers learn a new vocabulary and understanding that is only applicable in the math world. Because of our nation's growing emphasis on math skills—both for education and career—it is essential that ELLs acquire math skills at the same time they are gaining English language ability. This need is even more important for those ELLs designated as struggling learners under IDEA.

The most successful mathematics RtI solutions, particularly those specifically designed for ELLs, focus on four key academic concepts:

- ***Understand the main idea***—Presenting the lesson in an experiential way that comments to what students know and might have experienced in their own lives.
- ***Learn the vocabulary***—Providing students grade-level understanding of math vocabulary, both specialized math terms and everyday words with additional math meanings.
- ***Use more language***—Building on the acquisition of key vocabulary and the understanding of the main idea by addressing language structures and functions and how such concepts can be used to talk about the math topic.
- ***Solve math problems***—Allowing students to demonstrate success, both in the classroom and on local and state assessments.

Programs such as *Academic Language Notebooks:* The Language of Math ensure that all students gain the necessary math skills through instruction and materials that build on English language acquisition in English language development (ELD) classes. ALN's modular approach ensures it is an effective Tier 2 and Tier 3 RtI solution. As a Tier 2 intervention, ALN lessons can be used as targeted, explicit instruction provided within the classroom to small groups who need academic language support. As an intensive Tier 3 intervention, ALN can be used as an intensive push-in/pull-out small group support vehicle, allowing teachers to choose those lessons that match specific needs of individual students.

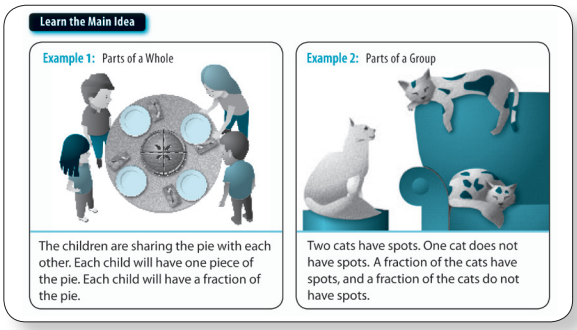
As part of a successful RtI program, teachers should apply rubrics that use specific tasks from classroom practice to evaluate student performance. These rubrics allow educators to determine if students have achieved the objective, and if they have not, what intervention can they benefit from. Subsequent intervention activities then provide direct support to "re-teach" the most difficult academic content.

With ALN, for instance, Perfection Learning has developed a comprehensive assessment and management tool for educators. The system tracks ELL performance and progress at the lesson level over time, identifying areas of individual challenge and targeting further intervention for each student. The data empowers teachers and administrators to compare individual students, classes, and schools, sorting all data by student, class, grade, and English language proficiency level.

Best Practices for Teaching ELLs

Best Practice 1: Comprehensible Language

Language is made more comprehensible by using clear language; by supporting meaning through the use of visuals and real objects; and by avoiding complex sentences, figurative or idiomatic phrases, and abstract vocabulary.



"With practice, teachers of ELLs can learn to recognize aspects of vocabulary, semantics, discourse patterns, and background knowledge that may prevent ELLs from fully understanding or producing the language they need in math classes and textbooks, and on math tests. One way to identify language problems is to observe students… but it is not very practical for larger groups of students. So a more effective way to identify language problems is to examine textbooks or tests, looking for language that is potentially difficult."
—Suzanne Irujo, ELL Outlook, Nov./Dec. 2007

As illustrated by the literacy instruction research of the National Academy of Sciences, the National Reading Panel, the U.S. Department of Education; from math-focused organizations such as the National Council of Teachers of Mathematics and the National Science Foundation; and from IDEA programs and special education experts, effective professional development and teacher support is just as important as having an effective instructional model. Success comes at the classroom level, from teachers who are knowledgeable and skilled in understanding various instructional approaches, who effectively apply them in the classroom, and who provide the interventions necessary to ensure all students are gaining the math abilities expected for their grade level.

To ensure all teachers are provided the guidance and support needed to succeed in the classroom, effective RtI programs such as *Academic Language Notebooks:* The Language of Math provide comprehensive teacher support focused on a range of Best Practices, including:

- Comprehensive Language
- Assessing, Activating, and Building Background Knowledge
- Performance Assessment
- Interaction
- Higher-Order Thinking
- Hands-on Activities

Such Best Practices are most effective when integrated throughout each teaching module, providing educators the opportunity to incorporate Best Practices as part of their everyday classroom practice. This allows teachers to see how a specific best practice can be utilized in their RtI classroom, particularly with ELL students.

Conclusion

If we are to move students in grades three through eight to reading and math proficiency, schools must effectively use Response to Intervention programs to assess student learning deficiencies, apply specific learning interventions, and provide ongoing student assessment and progress monitoring. This is particularly true among our English Language Learner population.

The existing body of academic research clearly demonstrates the impact RtI solutions such as *Academic Language Notebooks* can have on ELLs, offering proven-effective strategic (Tier 2) and intensive (Tier 3) interventions for struggling learners. Through a modular, non-sequential design and comprehensive teacher supports, ALN provides educators in grades three through eight the supplementary program they need to use the language of mathematics to improve math and English language proficiency among ELLs. Aligned with federal and state standards, *Academic Language Notebooks* provides schools a needed RtI tool to address comprehensive student achievement and improvement.

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