



REL / research digest
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Early Math Intervention Supports Algebra Success, College Goals

Ideally, students headed for college should complete beginning algebra by ninth grade. But according to the National Mathematics Advisory Panel (NMAP), the mathematics achievement of United States students drops sharply starting in late middle school, at the time most students should be completing their preparation for algebra.

Not surprisingly, a 2007 national survey of algebra teachers commissioned by NMAP showed that teachers rate their students' preparation for algebra 1 as "weak," with most teachers indicating that elementary students need to be more proficient in basic mathematics skills and concepts.

The NMAP Final Report (2008) recommended mathematics interventions as a method for improving mathematics knowledge and achievement. Building on this guidance, an expert panel of researchers and practitioners produced *Assisting Students Struggling with Mathematics: Response to Intervention (RtI) for Elementary and Middle Schools*, a Practice Guide published by the Institute of Education Sciences (IES) of the U.S. Department of Education.

Using this Practice Guide to frame the agenda, WestEd's Regional Educational Laboratory West (REL West) and California Comprehensive Center convened a half-day event on October 18 in San Jose to discuss ways to implement the Practice Guide recommendations to better prepare all California students to master algebra. The event, a pre-session for the 2010 California Algebra Forum III, which opened later that day, brought together members of the California Algebra Forum Professional

Learning Community, a collaborative effort among several state education groups that includes curriculum leaders, administrators, teachers, higher education representatives, and members of the business community.

Keynote speaker Sybilla Beckmann, professor of mathematics at the University of Georgia and one of the panel members who developed the IES Practice Guide, reviewed several of the guide's recommendations and discussed how they can be effectively employed in the classroom. The Practice Guide presents educators and administrators with evidence-based strategies to reduce the number of students struggling with mathematics through the use of Response to Intervention (RtI). RtI is a multi-level intervention system in which students identified as struggling are provided strategic, ongoing, small-group or one-on-one instruction and careful progress monitoring to determine whether the intervention improves their academic performance. Those who do not improve are provided more intensive intervention.

The guide provides eight recommendations for useful screening measures and effective content and pedagogy to include in RtI mathematics interventions:

REL West Research Digest keeps educators and others abreast of the research carried out by the Regional Educational Laboratory (REL) West at WestEd. In addition to providing abstracts of selected REL West research reports, this twice-yearly digest may include descriptions of upcoming REL West work, services, and events, and, as relevant to the Western region, of publications developed by other researchers.

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1. Screen all students to identify those struggling with mathematics and provide interventions accordingly
2. Provide in-depth focus on whole numbers in grades K–4 and on rational numbers in grades 4–8.
3. Make instruction explicit and systematic.
4. Include instruction on solving word problems based on common structures.
5. Allow students to work with visual representations of mathematical concepts.
6. Devote time to building fluent retrieval of basic arithmetic facts.
7. Monitor progress of students receiving intervention instruction and students at risk of needing intervention instruction.
8. Include motivational strategies for the most struggling students.

To develop these recommendations, the authors analyzed a variety of high-quality research, including evaluations of existing mathematics interventions for low-performing students and studies of the adequacy of screening and progress-monitoring measures. Each recommendation contains detailed implementation instructions, including discussions of potential roadblocks and solutions. In accordance with the

National Mathematics Advisory Panel’s emphasis on creating a streamlined approach for elementary *and* middle schools, all recommendations relate to RtI programs in kindergarten through eighth grade.

While many states have implemented RtI reading initiatives, RtI mathematics programs are still relatively new. Accordingly, a panel discussion at the October 18 REL West event focused on how the Practice Guide’s strategies are being implemented in California and what support California schools need for successful implementation. Participants also discussed how districts and technical assistance providers can support implementation of the Practice Guide strategies.

After the REL West event, many participants stayed for the 2010 California Algebra Forum, which featured interaction with leading state and national mathematics educators, and discussions of education policy and research that supports successful preparation for algebra.

Read more details about the REL West algebra event.

Download a copy of the IES Practice Guide, ***Assisting Students Struggling with Mathematics: Response to Intervention (RtI) for Elementary and Middle Schools***.

REL West School Turnaround Event Draws Educators from Six States

A two-day conference on leadership of school turnaround was hosted by REL West on September 30 and October 1 in Los Angeles, in partnership with the California and Southwest Comprehensive Centers. More than 160 educators from six states (Arizona, California, Colorado, Nevada, New Mexico, and Utah) participated, including state department of education staff, district administrators, and principals from schools engaged in school turnaround efforts through the School Improvement Grant (SIG) program.

In general sessions, breakout sessions, and state meetings, participants had the opportunity to learn from experts in the field and from one another about effective strategies for quickly raising the achievement of the lowest performing schools. Opening remarks by Thelma Meléndez de Santa Ana, Assistant Secretary for Elementary and Secondary Education, U.S. Department of Education, underscored the importance of the event in

relation to federal education priorities. Keynote speaker Bryan Hassel, co-director of Public Impact, outlined the theory and research related to school turnaround. Jon Schnur, CEO of New Leaders for New Schools, presented a keynote address on the connection between strong turnaround leadership and raising student achievement. A panel of district superintendents who have led successful turnaround initiatives described how that research plays out in the daily realities of striving to quickly improve student achievement in the region’s lowest-performing schools.

REL West is planning several events aimed at bringing researchers, practitioners, and policymakers together to address pressing regional issues during winter and spring of 2011. Proposed topics include postsecondary access and success, teacher evaluation and support, and use of data to drive school reform.

Read more details.

Selected Fast-Response and Technical Assistance Project Reports

In carrying out fast-response projects intended to inform quick action and policy decisions, and in providing technical assistance on regional evaluation and research activities, REL West researchers analyze or otherwise utilize existing data, studies, and research reviews. Results undergo external peer review to ensure that they meet the Institute of Education Sciences standards for scientifically valid research. The reports described below have been published since the previous issue of the Research Digest, July 2010. Published REL West reports are **available on our website**. Reports from all 10 RELs are **available on the national REL website**.

Where do English learners go to school? Distribution by language proficiency in Arizona

Research suggests several circumstances in which a school may face greater challenges in effectively teaching its English language learner (ELL) students and in closing the achievement gap between ELL students and those who are native English speakers: if it has high concentrations of ELL students; if it has many socioeconomically disadvantaged students; or if it is located in an urban or rural, as opposed to suburban, area. This technical brief analyzes Arizona's 2007/08 student-level data to determine how concentrations of ELL students vary across its schools and vary by the school characteristics described above.

Patterns of student mobility among English language learner students in Arizona public schools

Student mobility is commonly linked to lower student achievement, and Arizona has high rates of residential mobility. Using a statewide longitudinal data system, this report examines mobility patterns of all K–12 public education students in Arizona from 2004/05 to 2007/08. Mobility rates are presented by various student characteristics such as English language learner status, free- or reduced-price lunch status, special education status, ethnicity, grade level, and gender.

Conduct Your Own Workshop to Help Turn Around a Low-Performing School

REL West's free online Workshop Toolkit features:

- ❖ Evidence-based turnaround practices
- ❖ Downloadable facilitator's guide
- ❖ Links to multimedia resources

[View or download the toolkit on our website.](#)

UPCOMING FAST-RESPONSE REPORTS (working titles)

Do schools in rural and nonrural districts allocate resources differently? An analysis of spending and staffing patterns in rural and nonrural school districts in the West Region states

Rural communities face several challenges in providing educational services that suburban and urban areas do not. According to this report, which describes and analyzes 2005/06 school district-level data from Arizona, California, Nevada, and Utah, districts in rural communities spend more per student, hire more staff per 100 students, and spend more on overhead than do nonrural districts.

Analysis of labor market trends of California school-site administrators

In response to a previous REL West report, *School-site administrators: A California county and regional perspective on labor market trends*, additional analyses of the data were requested that could be used to plan for hiring and training new administrators. This report includes a 10-year projection of statewide, regional, and county need for school-site administrators broken into two- or three-year periods.

English proficiency in relation to academic achievement in Utah

For Title III documentation and state policymaking, the Utah State Office of Education requested a study of two key questions: 1) What is the relationship between tenth and eleventh graders' performance on the state's language proficiency test and their performance on the state's large-scale, criterion-referenced content assessment? 2) How does the performance of high school English language learner students on the content assessment compare to that of non-English learners?

ASK • A • REL

Ask A REL is a collaborative reference desk service provided by the 10 regional educational laboratories. Functioning much like a technical reference library, it answers education-related questions by providing referrals to IES research projects, publications, and reports; references for and bibliographies of existing education research; referrals to federally funded education organizations and websites; and regionally specific educational information. To **Ask A REL**, [go to the ASK A REL website](#) and select your state

IES Publishes Two REL West Experimental Research Studies

Reports of two REL West experimental research studies were approved and published this past summer by the Institute for Education Sciences of the U.S. Department of Education. The first was a randomized control trial in two Western states that looked at the effects of a problem-based high school economics curriculum on students' proficiency in economics. A problem-based curriculum uses real-world problems as a context for learning critical thinking and problem-solving skills, rather than a more traditional textbook-based approach. The study found a significant positive impact for students of teachers who received professional development and support in problem-based economics instruction, compared with their peers.

A second study investigated whether simplifying the language in standardized mathematics test questions — “linguistic modification” — made it easier for middle

school English language learner (ELL) students to focus on and grasp math concepts and was therefore a more accurate assessment of their math skills. Researchers found that linguistic modification of test items favored ELL students by allowing them greater access to the math content. The results contribute to the body of knowledge informing assessment practices and accommodations appropriate for ELL students. These are the first of six experimental research reports that REL West will complete in 2010/11.

View or download these reports:

[Effects of Problem Based Economics on High School Economics Instruction](#)

[Accommodations for English Language Learner Students: The Effect of Linguistic Modification of Math Test Item Sets](#)

Publications from Other Organizations

REL Northeast and Islands

[Do States Have Certification Requirements for Preparing General Education Teachers to Teach Students with Disabilities?](#) This report on teacher certification requirements in the nine Northeast and Islands Region jurisdictions finds that eight of them require some coursework in teaching students with disabilities for initial licensure. (August 2010)

National High School Center

[Tiered Interventions in High Schools: Using Preliminary “Lessons Learned” to Guide Ongoing Discussion](#). This document summarizes what the High School Tiered Interventions Initiative (HSTII) has learned thus far about effective RtI implementation in high schools. It provides a brief description of the RtI framework and the essential components of RtI. (May 2010)

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