

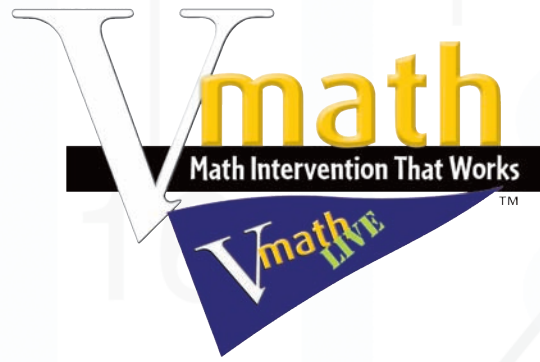
“To compete in the global economy, students must know math. Therefore, it is more important than ever that our students receive solid math instruction in the early grades to prepare them to take and pass Algebra and other challenging courses in middle school and high school.”

– Margaret Spellings, US Secretary of Education

America’s high school graduates need solid math skills to gain a sustainable edge in the global economy, whether proceeding directly in to the workforce or continuing on to college. In fact, according to the Bureau of Labor Statistics, jobs requiring science, engineering, or technical training will increase 24 percent between 2004 and 2014 to 6.3 million. Historically, these jobs were dominated by US workers, but with other nations now placing a stronger emphasis on math education and producing more highly-skilled workers that are filling these positions, our leadership status in the global marketplace is in jeopardy. To remain a world leader and continue to produce experts in fields that require mathematical mastery, it is critical the United States place a stronger emphasis on mathematics education.

Thus, under Presidential Executive Order in April 2006, the National Mathematics Advisory Panel was created to bring together the leaders in mathematics education to collaborate and recommend the most effective methods to advance the teaching and learning of mathematics in this country. After reviewing approximately 16,000 research studies and related documents and written testimony from 160 organizations and individuals, gathering public testimony from 110 individuals, holding twelve public meetings across the country, and conducting a survey of 743 Algebra I teachers, the panel released their final report in March 2008. The following key findings are included in the National Math Panel Final Report.

- **Algebra is a gateway to success in math.** A student’s performance in Algebra has a strong correlation to their success in upper level mathematics. A solid algebraic foundation also correlates strongly with access to college, graduation from college, and earning potential. In fact, a student who completes Algebra II is more than twice as likely to graduate from college. The critical foundations of algebra – whole numbers, fractions, and aspects of geometry and measurement – must be taught early to maximize student success. The panel suggests that a major goal for K–8 mathematics education should be proficiency with fractions (including decimals, percents, and negative fractions); proficiency with whole numbers is a necessary precursor for the study of fractions, as are aspects of measurement and geometry.
- **Explicit instruction works for struggling students.** Explicit instruction positively affects math achievement for students who have difficulty learning math. When students performing in the bottom third of the class and students with learning disabilities were taught through explicit instruction, their computational fluency and ability to solve word problems increased. In their report, the panel defines explicit instruction to mean that “teachers provide clear models for solving a problem type using an array of examples, that students receive extensive practice in use of newly learned strategies and skills, that students are provided with opportunities to think aloud (i.e., talk through the decisions they make and the steps they take), and that students are provided with extensive feedback.”
- **Balanced approach is recommended for concept development, computational fluency, and problem solving.** To best prepare students for Algebra, the curriculum should simultaneously develop conceptual understanding, computational fluency, and problem-solving skills. No research currently supports an entirely “student centered” or “teacher directed” approach; these capabilities support each other. As a result, it is recommended teachers employ a balanced approach focusing on conceptual understanding, developing fluency in procedures and number combinations, and building strong problem solving skills.
- **Effort Matters.** Often times, students who have found math difficult in the past are more reluctant to invest the time and energy required for success. But effort really does matter. In fact, recent studies show that shifting a student’s focus from their ability to their effort actually increases engagement, ultimately increasing mathematics achievement. When children believe their effort makes them “smarter,” they show greater persistence in learning. Therefore, educators can help students and parents understand that success in math is not dependent on ability, but on effort. If they try hard, and work diligently, they will be successful.



Vmath[®] is a research-based math intervention program designed for struggling elementary and middle school learners. Proven to accelerate and motivate at-risk students, *Vmath* targets learning gaps and builds a strong foundation in the essential skills and concepts of numeracy to prepare students for Algebra. *Vmath* uses a **balanced approach** of teacher-directed instructional materials and a student-centered technology component (*VmathLive*[™]) to help students **develop the essential math skills and concepts, problem-solving strategies, and reasoning abilities** needed to do higher-order mathematics. The program's **explicit instructional format** and detailed lesson support empowers teachers to deliver high-quality instruction. The web-based technology component, ***VmathLive***, **builds confidence** and rewards effort in an **engaging learning environment** designed to inspire interest and motivate reluctant learners. With an emphasis on the development of student proficiency in number sense, fractions, and aspects of geometry and measurement, ***Vmath* helps establish a solid algebraic foundation**, positioning students for success in the future.

Dr. Russell Gersten, executive director of the Instructional Research Group in Long Beach, CA, was among a group of 17 education experts and six ex-officio members named to the National Mathematics Advisory Panel. He also serves on the *Vmath* advisory board.



“Explicit instruction involving both teacher modeling and kids going through the steps in the models—in small groups or with the whole class or individually—seems to lead consistently to higher gains for kids that are struggling.”

“The hope is that this research will help change the trajectory for struggling math students in the near term, and provide guidance to make a long-term impact for future generations.”

– Dr. Russell Gersten (*Voyager Connection*, spring 2007)