

Robyn Silbey Professional Development Raising Teacher Quality and Student Achievement in Mathematics



We've turned the page to a New Year. Are your students willing and able to learn? According to the research, our futures depend on it.

Shout Out! Lewiston Public Schools



In This Issue

Two Issues: Ability and Interest

PISA Finds U.S. "About Average"

Two Issues We Can Address

A New York Times editorial asserts that students are not interested in STEM-related careers because they are convinced they are "no good at math." So which came first--the perceived lack of **ability** or the lack of **interest**?

The New York Times



To address students' faith in their ability, a University of Missouri (PLOS One) study reveals that the most important predictor of math success in middle school and upward is an understanding of what

Lewiston Public Schools in Lewiston, Maine are pumping up the focus on mathematics in their district. They have added math specialists at the elementary and middle school level, and have created a new curriculum that aligns with the Common Core.

To send a strong message that the emphasis on mathematics is here to stay, the leadership staff in Lewiston



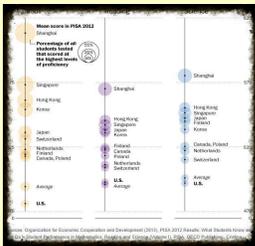
numbers are before entering the first grade. Having "number system knowledge" in kindergarten or earlier is a more important factor in math success by seventh grade than intelligence, race or income. Young children are naturally inquisitive about how things work. Early childhood and elementary teachers can capitalize on that curiosity by providing a rock-solid foundation of numbers and a keen fascination with mathematics.

To address the lack of interest, some schools are linking mathematics to potential employers and careers, truly taking math out of the classroom and into their lives. Real-life application can be as simple as a field trip to the grocery store, and as complex as your imagination allows you and your students to travel.

Teachers around the country agree that in Kindergarten and first grade, place value seems to be a strength. From second grade on, it becomes a weakness. Robyn's new workshops on place value and numeration, as well as whole number operations provide strategies for teachers to informally assess students' knowledge of our base ten place value system and teach or reteach using a variety of explorations, games, and learning stations to ensure understanding on a deeper level.



United States "About Average" on PISA International Assessment



A Washington Post report reveals that students scored "about average" in reading and science and below average in mathematics compared to 64 other countries and economies that participated in the 2012 Program for International Student Assessment, or PISA. The test is designed to measure whether

students can apply what they have learned in school to real-life problems. Over 500,000 students took the exam in the fall of 2012. Arne Duncan, the U.S. Secretary of Education, said the country must "invest in early education, raise academic standards, make college affordable, and do more to recruit and retain top-notch educators."

An OECD/PISA slideshow clarifies and explains the results further.



drafted a five-year plan that clearly describes goals at the district, school, coach, and teacher level. The mathematics leaders in Lewiston are dedicated to their cause, as evidenced in every building in the district.



Making Sense of and Working Through Problems



In the Coaches' Corner of the December/January Teaching Children Mathematics, Robyn takes a closer look at the Common Core Standards for Mathematical Practice 1:



Making Sense of Problems and Persevere in

Solving Them. This Standard bears a striking resemblance to Polya's four-step problem solving plan (How to Solve It, 1947): Understand, Plan, Solve, Look Back. As teachers guide students through the process, it is critical to place equal emphasis on all four stages, rather than "rushing to solve." Most critical is for students to genuinely *Understand* the problem so they can accurately and efficiently construct a *Plan* and use

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that plan to *Solve*. Of high importance is the fourth stage, *Look Back*, when students use logic, mental math and estimation, or related computations to assess their solutions for reasonableness.

More details appear in Robyn's article on page 279 of the Journal.

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