



SUPERINTENDENT OF PUBLIC INSTRUCTION

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Final K-8 Core/Comprehensive Mathematics Curricula Recommendations December 10, 2008

Presented by Dr. Terry Bergeson, State Superintendent

This document contains my final recommendations of basic mathematics curricula for the elementary (K-5) and middle school (6-8) grade spans. The high school (Grades 9-12) curricula recommendations will be presented in January 2009, along with the results of the K-12 supplemental materials review. This work is in response to requirements outlined in 2008 Second Substitute House Bill 2598 that requires the Office of Superintendent of Public Instruction (OSPI) to present recommendations of no more than three basic mathematics curricula at the elementary (K-5), middle (6-8) and high school (9-12) grade spans to the State Board of Education (SBE) for their review and comment. Following comment from the SBE, OSPI was then directed to, "...make any changes based on the comment and recommendations..." These final K-8 recommendations have been made with careful consideration of the review completed by the SBE contractor, Strategic Teaching, and their subsequent recommendations for OSPI.

Process Overview

In determining the K-8 curricula to recommend, OSPI conducted an instructional materials review of core/comprehensive mathematics programs. The revised mathematics standards for Grades K-8 that were adopted in April 2008, served as the basis for this review. The various viewpoints considered in the standards revision resulted in sound mathematics sequenced in an intentional manner from Kindergarten through Grade 8 through Core Content and related Performance Expectations. The curriculum review then compared programs for alignment to the standards and "Other Factors" categories: Program Organization and Design, Student Experience, Assessment, Instructional Planning and Professional Support, and Equity and Access. OSPI hired an independent contractor (Relevant Strategies) to provide support and statistical analysis expertise in conducting the review process and reporting the results.

The Relevant Strategies team worked closely with OSPI to engage groups of stakeholders that included the SBE Math Panel and school district curriculum advisors to develop the review instruments, criteria, and process for reviewing the instructional materials. These two groups determined two areas of focus of the review: Standards Alignment and Other Factors. These categories are detailed in the Final K-8 Recommendations Report that can be found online at <http://www.k12.wa.us/CurriculumInstruct/publishernotices.aspx>.

Both the Math Panel and the curriculum advisory underscored the critical importance of standards alignment and recommended weighting the content alignment at a threshold of 0.70. They both however underscored the importance of including the criteria within the "Other Factors" as part of the review as well, though at a lesser weighting of 0.30.

The process was rigorous and fair and included a highly qualified committee of 42 mathematics educators, business members, and parents that completed the thorough review of the programs. Steps were included throughout the review process to mitigate possible reviewer bias and to provide transparency.

After completing the curriculum review, a thorough synthesis of the review data, and an analysis of the results, OSPI solicited input from stakeholders (SBE Math Panel, curriculum advisors, and publishers) on the preliminary report that was issued in August 2008. OSPI then presented its “initial” recommendations to the SBE in September 2008. The legislation required recommendations of no more than three curricula per grade span. OSPI chose to initially recommend two curricula each at the elementary and middle school levels.

At the elementary level only the top two programs, *Math Connects* and *Bridges in Mathematics* met the content threshold of 0.70 at 0.734 and 0.715 respectively. The third and fourth curricula most closely aligned were statistically tied and did not meet the content threshold.

At the middle level, *Holt Mathematics* and *Math Connects* were recommended initially. These two programs met the content threshold at 0.855 and 0.741 respectively. As with elementary, there were statistical ties between the third and fourth curricula.

An additional requirement of the legislation was for at least one of the recommendations to be available online. One of the initial elementary recommendations (*Math Connects*) is available online, as are both of the initial middle school recommendations.

The SBE’s independent contractor, Strategic Teaching, undertook the next phase of the process to review OSPI’s initial recommendations. Strategic Teaching was directed by the SBE to review the top four programs for both elementary and middle school. Strategic Teaching used a slightly difference approach to review the programs that included content review at grades 2, 4 and 7, a mathematical review by one mathematician across key topics in each program. The SBE accepted the results of the Strategic Teaching review and recommended the following curricula to OSPI in light of the Strategic Teaching review:

SBE Elementary Recommendations (K-5)

- Math Connects
- **Revisit:** Bridges in Mathematics
- **Add:** Math Expressions

SBE Middle Recommendations (Grades 6-8)

- Holt Mathematics
- Math Connects
- **Add:** Prentice Hall

The full Strategic Teaching report and SBE recommendations can be found on the SBE website at: <http://www.sbe.wa.gov/mathstandards.htm>.

Final OSPI Elementary Recommendations

Based upon a careful analysis of the Strategic Teaching review and the SBE’s subsequent recommendations, I have made the decision to recommend three programs at the elementary school level: *Math Connects*, *Bridges in Mathematics*, and *Math Expressions*. *Math Connects* and *Bridges in Mathematics* met the proposed content threshold, and performed well on all of the factors measured.

While *Math Connects* was the top ranked elementary school program, it should be noted that it is a new program currently untested in Washington State. It was developed after the NCTM Curriculum Focal Points were produced in 2007. The relative newness of the program and its strong alignment to the Focal Points may explain its strong performance in the OSPI review, given that the revised Washington standards align closely with the NCTM Focal Points. Despite the newness and current limited use in Washington, ratings on the program across all scales were consistently high, and the program provides a good balance of conceptual understanding, computational and procedural fluency, and applications of what is learned to solve problems.

Acting on the SBE's advice to revisit *Bridges in Mathematics*, my staff commissioned two additional, independent mathematicians to review the three mathematical concepts which were called into question by Strategic Teaching's review. They thoroughly analyzed the development of multiplication, area of a triangle, and fractions over Grades 2-5 for mathematical soundness. Their approach aligned closely with the mathematical review conducted by Strategic Teaching's mathematician. Dr. Jim King from the University of Washington's Department of Mathematics and Dr. George Bright, Professor Emeritus from the University of North Carolina at Greensboro conducted OSPI's review for mathematical soundness. They concluded that the mathematical content in this program was sound and well developed overall.

While *Math Expressions* did not meet the proposed content threshold of 0.70, subsequent reviews by the SBE contractor, and two additional mathematicians indicated that the mathematics content was sound and well developed.

Math Connects is fully available online, while *Bridges in Mathematics* has only supplemental material available online. *Math Expressions* is fully available online.

As stated above the third and fourth ranked programs (*Investigations* and *Math Expressions*) are statistically tied. The review by the SBE contractor was very favorable to *Math Expressions* (with a content alignment of 0.624), and raised issues with the mathematics content in *Investigations*, despite its relatively strong content alignment of 0.628.

Final OSPI Middle School Recommendations

In light of the Strategic Teaching review and SBE recommendations, OSPI recommends three programs, *Holt Mathematics*, *Math Connects* and *Prentice Hall Mathematics* at the middle school level.

In middle school, *Holt Mathematics* clearly stands out. It had a content alignment score of 0.855 and performed consistently well across all "Other Factors" categories.

Math Connects, *Prentice Hall Mathematics* and *Math Thematics* are statistically tied based upon final composite scores. All three of these programs are viable choices for school districts to consider, and all met the minimum content threshold established as part of the review design process.

OSPI selected *Math Connects* among the ties for second rank because it sees significant value in having a product that spans Grades K-8 in the set of recommended programs.

Based upon the additional review by the SBE contractor, and because *Prentice Hall Mathematics* exceeded the initial content threshold of 0.70 with a score of 0.736, OSPI has added this program to the recommended list for middle school.

All three recommended programs are fully available online, and include additional supplemental material as well.

Conclusion

The legislature directed OSPI to recommend no more than three programs at each level, elementary, middle and high school.

<p><u>OSPI Final Elementary Recommendations (K-5)</u></p> <ul style="list-style-type: none"> • <i>Math Connects</i> • <i>Bridges in Mathematics</i> • <i>Math Expressions</i> 	<p><u>OSPI Final Middle Recommendations (Grades 6-8)</u></p> <ul style="list-style-type: none"> • <i>Holt Mathematics</i> • <i>Math Connects</i> • <i>Prentice Hall Mathematics</i>
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All six of the recommended programs at the elementary and middle school levels are closely aligned with the 2008 Washington Mathematics Standards and are mathematically sound. However, no program aligned completely to the new standards, and all will need some degree of supplementation. OSPI is engaging in a supplemental review and will provide an ancillary report that will highlight supplemental products that provide a good fit for the programs reviewed.

The next phase of this work is critical in providing the necessary support to districts choosing to adopt new programs based on the review results and to those choosing to retain their current mathematics instructional materials. It will be exceedingly important to provide supports in adapting these core programs to the revised standards that will be taught and tested in the coming years.

I deeply appreciate the excellent work of my staff on this project at OSPI and the many individuals who have contributed hours of their time and energy to review materials, and to provide thoughtful comment and insights throughout this process. I commend all who have been involved for their support in ensuring that the process has been inclusive and rigorous. Finally, I want to thank the State Board of Education board members, Steve Floyd as the SBE Math Panel lead, and the staff of the Board for their collaboration on this important project.