



WWC Intervention Report

A summary of findings from a systematic review of the evidence



Primary Mathematics

Updated June 2016*

enVisionMATH

This intervention report presents findings from a systematic review of *enVisionMATH* conducted using the What Works Clearinghouse (WWC) Procedures and Standards Handbook, version 3.0, and the Primary Mathematics review protocol, version 3.1. No studies of *enVisionMATH* that fall within the scope of the Primary Mathematics review protocol meet WWC group design standards. Because no studies meet WWC group design standards at this time, the WWC is unable to draw any conclusions based on research about the effectiveness or ineffectiveness of *enVisionMATH* on the mathematics achievement of primary students in grades K–6. Research that meets WWC design standards is needed to determine the effectiveness or ineffectiveness of this intervention.

Program Description¹

enVisionMATH, published by Pearson Education, Inc., is a core mathematics curriculum for students in grades K–6. The curriculum aims to help students develop an understanding of mathematics concepts through problem-based instruction, small-group interaction, and visual learning, with a focus on reasoning and modeling. Differentiated instruction and ongoing assessment are used to meet the needs of students at all ability levels. Within each grade, the curriculum is organized around clusters of Common Core standards and consists of 120–130 teacher-led lessons, with the intention that one lesson is completed per day. Each lesson includes daily review and a small-group, problem-based activity, followed by guided and independent, paired, or small-group practice activities. Instructors use daily assessments to track student progress and enable targeting of additional practice and homework activities for students that need more support. Lessons are organized into a customizable sequence of topics and use texts, workbooks, manipulatives, online web-based materials, and technology within group and individual activities.

Research^{2,3}

The WWC identified seven studies of *enVisionMATH* for primary students in grades K–6 that were published or released between 1983 and 2015.

Four studies are within the scope of the Primary Mathematics review protocol but do not meet WWC group design standards.

- Two studies used a randomized controlled trial to assess the effects of *enVisionMATH*. In one study, the integrity of the randomized design was jeopardized because the student sample was defined after teachers were randomly assigned to the intervention or comparison groups, and two intervention teachers were purposely excluded from the analysis due to low implementation fidelity. Because of these issues, the WWC requires the study to demonstrate equivalence between the analytic sample of students in the intervention and comparison groups; however, the study did not demonstrate equivalence. In the second study, the effect of *enVisionMATH* was confounded with another curriculum, since the analytic sample of intervention students used *Scott Foresman-Addison Wesley Mathematics (SFAW)* in first grade and *enVisionMATH* in second grade, whereas comparison students received a single curriculum in both grades 1 and 2. As such, the effects of *enVisionMATH* cannot be disentangled from those of *SFAW*.

- Two studies used quasi-experimental designs to assess the effects of *enVisionMATH*. One study did not demonstrate equivalence on the analytic samples. In the second study, the effects of *enVisionMATH* cannot be disentangled from district effects, since all of the intervention students were from one district, and all of the comparison students were from another district.

Three studies are out of the scope of the Primary Mathematics review protocol because they have ineligible study designs. These include publications that are not studies of the effectiveness of *enVisionMATH*.

References

Studies that do not meet WWC group design standards

Agodini, R., Harris, B., Seftor, N., Remillard, J., & Thomas, M. (2013). *After two years, three elementary math curricula outperform a fourth* (NCEE 2013-4019). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. <http://files.eric.ed.gov/fulltext/ED544185.pdf>. The study does not meet WWC group design standards because the measures of effectiveness cannot be attributed solely to the intervention.

Additional sources:

Agodini, R., Harris, B., Atkins-Burnett, S., Heaviside, S., Novak, T., & Murphy, R. (2009). *Achievement effects of four early elementary school math curricula: Findings from first graders in 39 schools* (NCEE 2009-4052). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. <http://files.eric.ed.gov/fulltext/ED504418.pdf>.

Agodini, R., Harris, B., Seftor, N., Remillard, J., & Thomas, M. (2013). *After two years, three elementary math curricula outperform a fourth. NCEE Technical Appendix* (NCEE 2013-4019-APPENDIX). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. <http://files.eric.ed.gov/fulltext/ED544187.pdf>.

Agodini, R., Harris, B., Thomas, M., Murphy, R., & Gallagher, L. (2010). *Achievement effects of four early elementary school math curricula: Findings for first and second graders* (NCEE 2011-4001). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. <http://files.eric.ed.gov/fulltext/ED512551.pdf>.

Resendez, M., & Azin, M. (2010). *A study on the relationship between Pearson's 2009 enVisionMATH program and student math performance among English language learners, minorities, and economically disadvantaged students: Special report*. Jackson, WY: PRES Associates. Retrieved from: <http://www.pearsoned.com/> The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Resendez, M., Azin, M., & Strobel, A. (2009). *A study on the effects of Pearson's 2009 enVisionMATH program: Final summative report*. Jackson, WY: PRES Associates. The study does not meet WWC group design standards because equivalence of the analytic intervention and comparison groups is necessary and not demonstrated.

Additional sources:

Resendez, M., & Azin, M. (2008). *A study on the effects of Pearson's 2009 enVisionMATH program: 2007-2008 first year report*. Jackson, WY: PRES Associates.

Resendez, M., & Azin, M. (2008). *A study on the effects of Pearson's 2009 enVisionMATH program: First year (2007-08) technical report*. Jackson, WY: PRES Associates.

Resendez, M., Barclay, R., & Azin, M. (2009). *A study on the effects of Pearson's 2009 enVisionMATH program: Summative 2007-09 technical report*. Jackson, WY: PRES Associates.

Starks, M. E. (2015). *A comparison of fifth grade mathematics curriculum materials* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3682291) The study does not meet WWC group design standards because the measures of effectiveness cannot be attributed solely to the intervention.

Studies that are ineligible for review using the Primary Mathematics Evidence Review Protocol

Fuchs, L. S., Schumacher, R. F., Sterba, S. K., Long, J., Namkung, J., Malone, A., ... Changas, P. (2014). Does working memory moderate the effects of fraction intervention? An aptitude-treatment interaction. *Journal of Educational Psychology, 106*(2), 499–514. The study is ineligible for review because it is out of scope of the protocol.

Hunt, J. H. (2014). Effects of a supplemental intervention focused in equivalency concepts for students with varying abilities. *Remedial and Special Education, 35*(3), 135–144. The study is ineligible for review because it is out of scope of the protocol.

Slonaker, R. V. (2013). *Assessment results and student achievement; A correlation study regarding ability grouping* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3602463) The study is ineligible for review because it is out of scope of the protocol.

Endnotes

* On January 3, 2017, the WWC modified this report in response to an independent review by a quality review team. Based on the review, the WWC corrected an erroneous statement in Endnote 2. The WWC has not added studies to the evidence base, updated the literature search, changed any study ratings, or changed values presented in tables since the June 2016 report.

¹ The descriptive information for this program was obtained from a publicly available source: the publisher's website (<http://www.pearsonschool.com>, downloaded November 2015). The WWC requests publishers to review the program description sections for accuracy from their perspective. The program description was provided to the publisher in December 2015, and the WWC incorporated feedback from the publisher. Further verification of the accuracy of the descriptive information for this program is beyond the scope of this review.

² The literature search reflects documents publicly available by October 2015. The WWC previously released a report on *enVision-MATH* under the Elementary School Mathematics review protocol in January 2013. This report has been updated to include reviews of five studies that have been released since that date. Of the additional studies, three were not within the scope of the protocol, and two were within the scope of the protocol but did not meet WWC group design standards. A complete list and disposition of all studies reviewed are provided in the references.

This report includes reviews of all studies that met WWC group design standards with or without reservations in the previous report. The reviews resulted in a revised disposition for one study: Resendez and Azin (2008), which was previously rated as *meets WWC evidence standards without reservations*. The change in rating is due to the fact that the study was previously reviewed using version 2.1 standards, and is currently reviewed using version 3.0 standards, which include a clarification in guidance regarding compromised random assignment. This updated guidance indicates that if an author of a randomized controlled trial deliberately excludes sample members based on a measure that was determined after randomization and could be affected by the intervention (as done by this study's authors), then the study must demonstrate equivalence on the analytic sample. Since the study does not demonstrate equivalence as required, it is now rated does not meet WWC group design standards.

The studies in this report were reviewed using the Standards from the WWC Procedures and Standards Handbook (version 3.0), along with those described in the Primary Mathematics review protocol (version 3.1). The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.

³ Absence of conflict of interest: This intervention report includes a study conducted by staff from Mathematica Policy Research. Because Mathematica is one of the contractors that administers the WWC, the study was reviewed by staff members from a different organization. This report was reviewed by the lead methodologist, a WWC Quality Assurance reviewer, and an external peer reviewer.

Recommended Citation

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Primary Mathematics intervention report: enVisionMATH. Retrieved from <http://whatworks.ed.gov>

Glossary of Terms

Attrition	Attrition occurs when an outcome variable is not available for all participants initially assigned to the intervention and comparison groups. The WWC considers the total attrition rate and the difference in attrition rates across groups within a study.
Clustering adjustment	If intervention assignment is made at a cluster level and the analysis is conducted at the student level, the WWC will adjust the statistical significance to account for this mismatch, if necessary.
Confounding factor	A confounding factor is a component of a study that is completely aligned with one of the study conditions, making it impossible to separate how much of the observed effect was due to the intervention and how much was due to the factor.
Design	The design of a study is the method by which intervention and comparison groups were assigned.
Domain	A domain is a group of closely related outcomes.
Effect size	The effect size is a measure of the magnitude of an effect. The WWC uses a standardized measure to facilitate comparisons across studies and outcomes.
Eligibility	A study is eligible for review and inclusion in this report if it falls within the scope of the review protocol and uses either an experimental or matched comparison group design.
Equivalence	A demonstration that the analysis sample groups are similar on observed characteristics defined in the review area protocol.
Extent of evidence	An indication of how much evidence supports the findings. The criteria for the extent of evidence levels are given in the WWC Procedures and Standards Handbook (version 3.0).
Improvement index	Along a percentile distribution of individuals, the improvement index represents the gain or loss of the average individual due to the intervention. As the average individual starts at the 50th percentile, the measure ranges from -50 to +50.
Intervention	An educational program, product, practice, or policy aimed at improving student outcomes.
Intervention report	A summary of the findings of the highest-quality research on a given program, product, practice, or policy in education. The WWC searches for all research studies on an intervention, reviews each against design standards, and summarizes the findings of those that meet WWC design standards.
Multiple comparison adjustment	When a study includes multiple outcomes or comparison groups, the WWC will adjust the statistical significance to account for the multiple comparisons, if necessary.
Quasi-experimental design (QED)	A quasi-experimental design (QED) is a research design in which study participants are assigned to intervention and comparison groups through a process that is not random.
Randomized controlled trial (RCT)	A randomized controlled trial (RCT) is an experiment in which eligible study participants are randomly assigned to intervention and comparison groups.
Rating of effectiveness	The WWC rates the effects of an intervention in each domain based on the quality of the research design and the magnitude, statistical significance, and consistency in findings. The criteria for the ratings of effectiveness are given in the WWC Procedures and Standards Handbook (version 3.0).
Single-case design	A research approach in which an outcome variable is measured repeatedly within and across different conditions that are defined by the presence or absence of an intervention.

Glossary of Terms

- Standard deviation** The standard deviation of a measure shows how much variation exists across observations in the sample. A low standard deviation indicates that the observations in the sample tend to be very close to the mean; a high standard deviation indicates that the observations in the sample tend to be spread out over a large range of values.
- Statistical significance** Statistical significance is the probability that the difference between groups is a result of chance rather than a real difference between the groups. The WWC labels a finding statistically significant if the likelihood that the difference is due to chance is less than 5% ($p < .05$).
- Substantively important** A substantively important finding is one that has an effect size of 0.25 or greater, regardless of statistical significance.
- Systematic review** A review of existing literature on a topic that is identified and reviewed using explicit methods. A WWC systematic review has five steps: 1) developing a review protocol; 2) searching the literature; 3) reviewing studies, including screening studies for eligibility, reviewing the methodological quality of each study, and reporting on high quality studies and their findings; 4) combining findings within and across studies; and, 5) summarizing the review.

Please see the WWC Procedures and Standards Handbook (version 3.0) for additional details.



An **intervention report** summarizes the findings of high-quality research on a given program, practice, or policy in education. The WWC searches for all research studies on an intervention, reviews each against evidence standards, and summarizes the findings of those that meet standards.

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