What Works Clearinghouse

INSTITUTE OF EDUCATION SCIENCES

MathThematics

Effectiveness

No studies of *MathThematics* that fall within the scope of the Middle School Math review meet WWC evidence standards. The lack of studies meeting WWC evidence standards means that, at this time, the WWC is unable to draw any conclusions based on research about the effectiveness or ineffectiveness of *MathThematics*.

Program Description[1]

MathThematics is a mathematics curriculum for grades 6 through 8 that combines activity-based, discovery learning with direct instruction. The textbook for each grade level has eight instructional modules, with each module focused on a theme.

Open-ended questions and projects are utilized throughout the curriculum to assess problem-solving skills and the ability to communicate mathematically.

The WWC identified seven studies of *MathThematics* that were published or released between 1983 and 2008.

Five studies are within the scope of the review and have an eligible design, but do not meet WWC evidence standards.

- Two studies do not establish that the comparison group was comparable to the treatment group prior to the start of the intervention.
- Three studies have confounding factors, such as combining with other interventions, or having only one unit of analysis in one or both conditions, which makes it impossible to attribute the observed effect solely to *MathThematics*.

One study is out of the scope of the review because the study does not use a comparison group.

One study is out of the scope of the review, as defined by the Middle School Math protocol, because the study does not include math achievement as an outcome.

1. The descriptive information for this program was obtained from publicly-available sources: the program's website (http://www.mcdougallittell.com/ml/math.htm?level2Code=MM&lvl=3, downloaded August 2008) and information from the K–12 Mathematics Curriculum Center's curriculum summary materials (http://www2.edc.org/mcc/PDF/CurricSum8.pdf, downloaded August 2008). The WWC requests developers to review the program description sections for accuracy from their perspective. Further verification of the accuracy of the descriptive information for this program is beyond the scope of this review.

References

Studies that fall outside the Middle School Math protocol or do not meet evidence standards:

Bay, J. M., Beem, J. K., Reys, R. E., Papick, I., & Barnes, D. E. (1999). Student reactions to standards-based mathematics curricula: The interplay between curriculum, teachers, and students. *School Science and Mathematics, 99*(4), 182–188. The study is ineligible for review because it does not include an outcome within a domain specified in the protocol.

Billstein, R., & Williamson, J. (2002). Middle Grades MATHThematics: The STEM project. In S. L. Senk & D. R. Thompson (Eds.), *Standards-based school mathematics curricula: What are they? What do students learn?* (pp. 251–284). Mahwah, NJ: Lawrence Erlbaum Associates, Inc. The study does not meet WWC evidence standards because the intervention and comparison groups are not shown to be equivalent at baseline.

Lapan, R., Reys, B., Reys, R., & Holliday, G. (2001). *Assessing the performance of middle grade students using standards-based mathematics instructional materials*. (Available from the University of Missouri, 121 Townsend Hall, Columbia, MO 65211) The study does not meet WWC evidence standards because the measures of effect cannot be attributed solely to the intervention—there was only one unit of analysis in one or both conditions.

Lapan, R. T., Reys, B. J., Barnes, D. E., & Reys, R. E. (1998). *Standards-based middle grade mathematics curricula: Impact on student achievement*. Paper presented at the meeting of the American Educational Research Association, San Diego, CA. The study does not meet WWC evidence standards because the intervention and comparison groups are not shown to be equivalent at baseline.

Post, T. R., Harwell, M. R., Davis, J. D., Maeda, Y., Cutler, A., Andersen, E., et al. (2008). "Standards"-based mathematics curricula and middle-grades students' performance on standardized achievement tests. *Journal for Research in Mathematics Education, 39*(2), 184–212. The study is ineligible for review because it does not use a comparison group.

Reys, R., Reys, B., Lapan, R., Holliday, G., & Wasman, D. (2003). Assessing the impact of standards-based middle grades mathematics curriculum materials on student achievement. *Journal for Research in Mathematics Education, 34*(1), 74–95. The study does not meet WWC evidence standards because the measures of effect cannot be attributed solely to the intervention—there was only one unit of analysis in one or both conditions.

Additional source:

Reys, R., Reys, B., Lapan, R., Holliday, G., & Wasman, D. (2004). Assessing the impact of standards-based middle grades mathematics curriculum materials on student achievement: Corrections. *Journal for Research in Mathematics Education, 35*(2), 152.

Tarr, J. E., Reys, R. E., Reys, B. J., Chavez, O., Shih, J., & Osterlind, S. J. (2008). The impact of middle-grades mathematics curricula and the classroom learning environment on student achievement. *Journal for Research in Mathematics Education, 39*(3), 247–280. The study does not meet WWC evidence standards because the measures of effect cannot be attributed solely to the intervention—the intervention was combined with another intervention.

Additional source:

Reys, R., Reys, B., Tarr, J., & Chavez, O. (2006). *Assessing the impact of standards-based middle school mathematics curricula on student achievement and the classroom learning environment*. Washington, DC: National Center for Education Research.