

Reading Mastery

Program Description¹

Reading Mastery, one of several Direct Instruction curricula from McGraw-Hill, is designed to provide explicit reading instruction to students in grades pre-K–5. The program is available in two versions:

- *Reading Mastery Classic* (for grades pre-K–2) aims to help beginning readers identify letter sounds, segment words into sounds, blend sounds into words, develop vocabulary, and begin to learn comprehension strategies. *Reading Mastery Classic* consists of two levels. *Reading Mastery Fast Cycle* is an accelerated program that condenses Levels I and II.
- *Reading Mastery Signature Edition* (for grades K–5) is organized by grade level and includes three strands: reading, language arts, and literature. The reading strand addresses phonemic awareness, phonics, word analysis, fluency, vocabulary, comprehension, spelling, decoding, and word recognition skills. The language arts strand focuses on oral language, communication, and writing skills. The literature strand is designed to provide students with opportunities to read different types of text and to develop their vocabulary.

Reading Mastery can be used as a supplement to a core reading program or as a stand-alone reading program for students with or without disabilities. This intervention report specifically focuses on the use of *Reading Mastery* to improve the reading and writing skills of students with learning disabilities.

Research²

The What Works Clearinghouse (WWC) identified one study of *Reading Mastery* that falls within the scope of the Students with Learning Disabilities topic area and meets WWC evidence standards. In this study, *Reading Mastery* was compared to *Horizons Fast Track*, another Direct Instruction intervention that shares many important design features. (*Horizons* was developed in response to feedback on *Reading Mastery*.) This study meets standards without reservations and included 30 students with learning disabilities in grades 2–4 in one location.

The WWC considers the extent of evidence for *Reading Mastery* on the achievement of students with learning disabilities to be small for two outcome domains—alphabetics and reading comprehension. There were no studies that meet standards in seven other domains, so we do not report on the effectiveness of *Reading Mastery* for those domains in this intervention report. (See the Effectiveness Summary on p. 5 for further description of all domains.)

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Effectiveness

When compared to another Direct Instruction intervention, *Horizons, Reading Mastery* was found to have no discernible effects on alphabetics and reading comprehension for students with learning disabilities.

Table 1. Summary of findings³

Outcome domain	Rating of effectiveness	Improvement index (percentile points)		Number of studies	Number of students	Extent of evidence
		Average	Range			
Alphabetics	No discernible effects	+2	-6 to +7	1	30	Small
Reading comprehension	No discernible effects	-1	na	1	30	Small

na = not applicable

Program Information

Background

Reading Mastery is based on the original DISTAR (Direct Instruction System for Teaching Arithmetic and Reading) program. Early versions of *Reading Mastery* were developed by Siegfried Engelmann as part of the Direct Instruction teaching model. *Reading Mastery* is distributed by McGraw-Hill Education, P.O. Box 182605, Columbus, OH 43218. Email: SEG_customerservice@mcgraw-hill.com. Website: <https://www.mheonline.com>. Telephone: (800) 334-7344.

Program details

Reading Mastery is designed for elementary-age students at all levels of reading performance, and can be used with English language learners and students with learning disabilities. A typical 30- to 45-minute *Reading Mastery* lesson includes seven to nine short activities. The activities encompass multiple strands of content, such as phonemic awareness, letter-sound correspondence, sounding out words, word recognition, vocabulary, oral reading fluency, and comprehension. Program materials include fully scripted lessons to guide teachers through repeated instructional steps (model new content, provide guided practice, and implement individual practice and application). Signals and group responses are used to keep students involved, help them stay on task, and to control lesson pacing. Teachers assess student performance throughout the program, and struggling students receive remedial exercises. The program typically spans 1 academic year.

Cost

Student materials include storybooks (grades pre-K–1) or textbooks (grades 2–6), workbooks, and test books. The cost per student ranges from \$200 to \$300 for the first year of implementation. A full set of teaching materials—a one-time purchase—costs between \$650 and \$1,000 for each grade level. Additional components include literature collections, independent readers, seatwork blackline masters, and practice and review CD-ROMs for students. SRA Teaching Tutor CD-ROMs supplement consultant-led professional development. Additional information on costs of training materials and workshops is available at <https://www.mheonline.com>.

Research Summary

The WWC identified 22 studies that investigated the effects of *Reading Mastery* on the achievement of students with learning disabilities.

The WWC reviewed two of those studies against group design evidence standards. One study (Cooke, Gibbs, Campbell, & Shalvis, 2004) is a randomized controlled trial that meets WWC evidence standards without reservations. That study is summarized in this report. One study does not meet WWC evidence standards. The remaining 20 studies do not meet WWC eligibility screens for review in this topic area. Citations for all 22 studies are in the References section, which begins on p. 7.

Table 2. Scope of reviewed research

Grades	2, 3, 4
Delivery method	Whole class
Program type	Curriculum

Summary of study meeting WWC evidence standards without reservations

Cooke et al. (2004) examined the effect of *Reading Mastery* on the alphabetic achievement and reading comprehension of 30 students in grades 2–4 from three elementary schools in a suburban school district in the southeastern United States. The study involved three teachers and occurred over 2 years. One school participated both years, the second school participated in the first year, and the third school participated in the second year. Each school had two preexisting special education groups of three to five students, and within each school, these groups were randomly assigned to implement either *Reading Mastery Fast Cycle* or *Horizons Fast Track*. *Reading Mastery Fast Cycle* and *Horizons Fast Track* were each implemented in 30- to 40-minute sessions, 5 days a week, over 1 year. *Horizons* and *Reading Mastery* share a developer and many important design features, and *Horizons* was developed in response to feedback on *Reading Mastery*. The study was conducted to examine whether the limited substantive differences between the interventions led to different effects. The final sample included 15 students in each condition. Fifty percent of the students in the combined *Reading Mastery Fast Cycle* and *Horizons Fast Track* groups were identified as learning disabled. The remaining students had other disabilities, such as behavioral/emotional disabilities or other health impairments.

Summary of studies meeting WWC evidence standards with reservations

No studies of *Reading Mastery* met WWC evidence standards with reservations.

Effectiveness Summary

The WWC review of *Reading Mastery* for the Students with Learning Disabilities topic area includes student outcomes in nine domains: alphabetics, reading fluency, reading comprehension, general reading achievement, mathematics, writing, science, social studies, and progressing in school. The one study of *Reading Mastery* that meets WWC evidence standards reported findings in two of the nine domains: (a) alphabetics and (b) reading comprehension. The findings below present the authors' estimates and WWC-calculated estimates of the size and statistical significance of the effects of *Reading Mastery* on students with learning disabilities. For a more detailed description of the rating of effectiveness and extent of evidence criteria, see the WWC Rating Criteria on p. 16.

Summary of effectiveness for the alphabetics domain

One study that meets WWC standards without reservations reported findings in the alphabetics domain.

Cooke et al. (2004) found no statistically significant effects of *Reading Mastery Fast Cycle* (when compared to *Horizons Fast Track*, another Direct Instruction intervention) on three measures of alphabetics: the Letter-Word Identification and Word Attack subtests of the Woodcock-Johnson Psycho-Educational Battery–Revised (WJ-R) and the North Carolina Literacy Assessment. The WWC-calculated effect size for this measure was not large enough to be considered substantively important. The WWC characterizes these study findings as an indeterminate effect.

Thus, for the alphabetics domain, no studies found statistically significant or substantively important effects. This results in a rating of no discernible effects, with a small extent of evidence.

Table 3. Rating of effectiveness and extent of evidence for the alphabetics domain

Rating of effectiveness	Criteria met
No discernible effects <i>No affirmative evidence of effects.</i>	In the one study that reported findings, the estimated impact of the intervention on outcomes in the <i>alphabetics</i> domain was neither statistically significant nor large enough to be substantively important.
Extent of evidence	Criteria met
Small	One study that included 30 students in three elementary schools reported evidence of effectiveness in the <i>alphabetics</i> domain.

Table Note: The number of classrooms is not reported in Cooke et al. (2004).

Summary of effectiveness for the reading comprehension domain

One study that meets WWC standards without reservations reported findings in the reading comprehension domain.

Cooke et al. (2004) found no statistically significant effects of *Reading Mastery Fast Cycle* (when compared to *Horizons Fast Track*, another Direct Instruction intervention) on one measure of reading comprehension: the Passage Comprehension subtest of the WJ-R. The WWC-calculated effect size for this measure was not large enough to be considered substantively important. The WWC characterizes these study findings as an indeterminate effect.

Thus, for the reading comprehension domain, no studies found statistically significant or substantively important effects. This results in a rating of no discernible effects, with a small extent of evidence.

Table 4. Rating of effectiveness and extent of evidence for the reading comprehension domain

Rating of effectiveness	Criteria met
No discernible effects <i>No affirmative evidence of effects.</i>	In the one study that reported findings, the estimated impact of the intervention on outcomes in the <i>reading comprehension</i> domain was neither statistically significant nor large enough to be substantively important.
Extent of evidence	Criteria met
Small	One study that included 30 students in three elementary schools reported evidence of effectiveness in the <i>reading comprehension</i> domain.

Table Note: The number of classrooms is not reported in Cooke et al. (2004).

References

Study that meets WWC evidence standards without reservations

Cooke, N. L., Gibbs, S. L., Campbell, M. L., & Shalvis, S. L. (2004). A comparison of Reading Mastery Fast Cycle and Horizons Fast Track A-B on the reading achievement of students with mild disabilities. *Journal of Direct Instruction, 4*(2), 139–151.

Studies that meet WWC evidence standards with reservations

None.

Study that does not meet WWC evidence standards

Earheart, L. S. (2002). The efficacy of the SRA reading program for disabled learners as measured by the Terra Nova achievement test. *Dissertation Abstracts International, 63*(08A), 57-2823. (AAI3061780). The study does not meet WWC evidence standards because the measures of effectiveness cannot be attributed solely to the intervention—there was only one unit assigned to one or both conditions.

Studies that are ineligible for review using the Students with Learning Disabilities Evidence Review Protocol

- Adams, G. L., & Engelmann, S. (1995). *Research on direct instruction: 25 years beyond DISTAR*. Seattle, WA: Educational Achievement Systems. The study is ineligible for review because it is a secondary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.
- Butler, M. T. (2002). Comparison of the effects of direct instruction and basal instruction on the reading achievement of first-grade students identified as students with reading difficulties. *Dissertation Abstracts International Section A: Humanities and Social Sciences, 62*(9-A), 3002. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample includes less than 50% students with learning disabilities.
- Coughlin, C. (2011, May). *Research on the effectiveness of direct instruction programs: An updated meta-analysis*. Poster presented at the Annual Meeting of the Association for Behavior Analysis International, Denver, CO. NIFDI Technical Report 2011-4. The study is ineligible for review because it is a secondary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.

Additional sources:

- Coughlin, C. (2011). *Research on the effectiveness of direct instruction programs: An updated meta-analysis (short report)*. NIFDI Technical Report 2011-3. Eugene, OR: National Institute for Direct Instruction.
- Coughlin, C. (2011, May). *Research on the effectiveness of direct instruction programs: An updated meta-analysis*. Unpublished supplementary tables with raw data. Poster presented at the Annual Meeting of the Association for Behavior Analysis International, Denver, CO. NIFDI Technical Report 2011-4.
- Fitzpatrick, E., McLaughlin, T. F., & Weber, K. P. (2004). The effects of a first day and second day reads on reading accuracy with Reading Mastery III Textbook B for a fifth grade student with learning disabilities. *International Journal of Special Education, 19*(1), 56–63. The study is ineligible for review because it does not use a comparison group design or a single-case design.
- Frankhauser, M. A., Tso, M. E., & Martella, R. C. (2001). A comparison of curriculum-specified reading checkout timings and daily 1-minute timings on student performance in reading mastery. *Journal of Direct Instruction, 1*(2), 85–96. The study is ineligible for review because it does not test the effectiveness of *Reading Mastery*.
- Herrera, J. A., Logan, C. H., Cooker, P. G., Morris, D. P., & Lyman, D. E. (1997). Phonological awareness and phonetic-graphic conversion: A study of the effects of two intervention paradigms with learning disabled children. Learning disability or learning difference? *Reading Improvement, 34*(2), 71–89. The study is ineligible for review because it does not provide enough information about its design to assess whether it meets standards.
- Kanfush, P. M., III. (2010). *Use of direct instruction to teach reading to students with significant cognitive impairments: Student outcomes and teacher perceptions*. Ann Arbor, MI: ProQuest, LLC. The study is ineligible for

review because the WWC could not confirm that at least 50% of the sample was classified as students with learning disabilities.

- Kinder, D., Kubina, R., & Marchand-Martella, N. (2005). Special education and direct instruction: An effective combination. *Journal of Direct Instruction*, 5(1), 1–36. The study is ineligible for review because it is a secondary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.
- Lovett, M. W., Steinbach, K. A., & Frijters, J. C. (2000). Remediating the core deficits of developmental reading disability: A double-deficit perspective. *Journal of Learning Disabilities*, 33(4), 334–358. The study is ineligible for review because it does not use a comparison group design or a single-case design.
- Marston, D., Deno, S. L., Kim, D., Diment, K., & Rogers, D. (1995). Comparison of reading intervention approaches for students with mild disabilities. *Exceptional Children*, 62(1), 20–37. The study is ineligible for review because the WWC could not confirm that the intervention was *Reading Mastery* and that at least 50% of the sample was classified as students with learning disabilities.
- O'Connor, R. E., Jenkins, J. R., Cole, K. N., & Mills, P. E. (1993). Two approaches to reading instruction with children with disabilities: Does program design make a difference? *Exceptional Children*, 59(4), 312–323. The study is ineligible for review because the WWC could not confirm that at least 50% of the sample was classified as students with learning disabilities.
- Additional source:**
- O'Connor, R. E., Jenkins, J. R., Cole, K. N., & Mills, P. E. (1992). *Two approaches to reading instruction for children with disabilities: Does program design make a difference?* Unpublished manuscript.
- Riepl, J. H., Marchand-Martella, N. E., & Martella, R. C. (2008). The effects of Reading Mastery Plus on the beginning reading skills of students with intellectual and developmental disabilities. *Journal of Direct Instruction*, 8(1), 29–39. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample includes less than 50% students with learning disabilities.
- Scammacca, N., Vaughn, S., Roberts, G., Wanzek, J., & Torgesen, J. K. (2007). *Extensive reading interventions in grades K–3: From research to practice*. Portsmouth, NH: Center on Instruction. The study is ineligible for review because it is a secondary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.
- Schieffer, C., Marchand-Martella, N. E., Martella, R. C., Simonsen, F. L., & Waldron-Soler, K. M. (2002). An analysis of the Reading Mastery program: Effective components and research review. *Journal of Direct Instruction*, 2(2), 87–119. The study is ineligible for review because it is a secondary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.
- SRA/McGraw-Hill. (n.d.) *Exceptional education and regular education students excel with direct instruction*. Retrieved from: http://www.mheresearch.com/assets/products/c9f0f895fb98ab91/iredell_statesville_schools.pdf The study is ineligible for review because it does not use a comparison group design or a single-case design.
- SRA/McGraw-Hill. (2006). *Reading Mastery, corrective reading help students with disabilities achieve significant academic growth*. DeSoto, TX: Author. The study is ineligible for review because it does not use a comparison group design or a single-case design.
- SRA/McGraw-Hill. (2009). *A report on the effects of SRA/McGraw-Hill's Reading Mastery, Signature Edition: A response to intervention solution*. DeSoto, TX: Author. The study is ineligible for review because it does not use a sample aligned with the protocol—the sample includes less than 50% students with learning disabilities.
- Stewart, R. M., Benner, G. J., Martella, R. C., & Marchand-Martella, N. E. (2007). Three-tier models of reading and behavior: A research review. *Journal of Positive Behavior Interventions*, 9(4), 239–253. The study is ineligible for review because it is a secondary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.

- Stockard, J. (2008). *Reading achievement in a Direct Instruction school and a "Three Tier" curriculum school, NIFDI Technical Report 2008-5*. Eugene, OR: National Institute for Direct Instruction. The study is ineligible for review because the WWC could not confirm that at least 50% of the sample was classified as students with learning disabilities.
- Swanson, H. L. (2011). Learning disabilities: Assessment, identification, and treatment. In M. A. Bray and T. J. Kehle (Eds.), *The Oxford handbook of school psychology* (pp. 334–350). New York: Oxford University Press. The study is ineligible for review because it is a secondary analysis of the effectiveness of an intervention, such as a meta-analysis or research literature review.

Appendix A: Research details for Cooke et al., 2004

Cooke, N. L., Gibbs, S. L., Campbell, M. L., & Shalvis, S. L. (2004). A comparison of Reading Mastery Fast Cycle and Horizons Fast Track A-B on the reading achievement of students with mild disabilities. *Journal of Direct Instruction, 4*(2), 139–151.

Table A. Summary of findings

Meets WWC evidence standards without reservations

Outcome domain	Sample size	Study findings	
		Average improvement index (percentile points)	Statistically significant
Alphabetics	3 schools/30 students	+2	No
Reading comprehension	3 schools/30 students	-1	No

Setting The study was conducted in three schools in a suburban district in the southeastern United States.

Study sample The sample for this study included a total of 30 students from grades 2–4 taught by three teachers in three elementary schools. All students in the study had been identified by school district staff as needing special education services. The study occurred over 2 years—one school participated in both years, the second school participated in the first year, and the third school participated in the second year. Prior to the start of the study, two groups of three to five students had been formed in each school. Within schools, the student groups were randomly assigned to receive either *Reading Mastery Fast Cycle* or *Horizons Fast Track*, resulting in 15 students receiving each intervention. In total, there were 15 students identified as learning disabled—ten in the study group and five in the comparison group. The remaining 15 students had other disabilities, such as behavioral/emotional disabilities or other health impairments. At each school, one teacher delivered both the *Reading Mastery Fast Cycle* and *Horizons Fast Track* interventions. The authors reported no group or student attrition.

Intervention group *Reading Mastery Fast Cycle* is a version of *Reading Mastery* that teaches at a faster rate with less repetition than conventional *Reading Mastery*. In the present study, *Reading Mastery Fast Cycle* was implemented in 30- to 40-minute sessions, 5 days a week, over 1 school year.

Comparison group *Horizons Fast Track* shares the same developer and many program characteristics with *Reading Mastery Fast Cycle* and was developed in response to feedback on *Reading Mastery*. The two programs differ in sequence, procedures, prompts, orthographic conventions, and teacher presentation materials. For example, *Reading Mastery Fast Cycle* teaches letter sounds before letter names, whereas *Horizons Fast Track* requires students to use letter names as assistance in learning letter sounds. *Reading Mastery Fast Cycle* does not use capital letters early in the program; *Horizons Fast Track* includes the use of capital letters in the first lessons that present sentences. Finally, *Reading Mastery Fast Cycle* uses special forms of letters to elicit the correct sounds for confusing letters, letter combinations, or silent letters; *Horizons Fast Track* uses underlining and color changes. Teachers implemented *Horizons Fast Track* in 30- to 40-minute sessions, 5 days a week over the year, following the scripted procedure and repeating lessons when necessary.

Outcomes and measurement

The study authors administered several reading measures at pretest and posttest. Alphabets was measured by the Letter-Word Identification and Word Attack subtests of the Woodcock-Johnson Psycho-Educational Battery–Revised (WJ-R) and the North Carolina Literacy Assessment. Reading comprehension was measured by the Passage Comprehension subtest of the WJ-R. The authors combined Letter-Word Identification and Passage Comprehension to form a Broad Reading Score and combined Letter-Word Identification and Word Attack to form a Basic Reading Score. These combined measures were not examined in the WWC analysis. For a more detailed description of these outcome measures, see Appendix B.

Support for implementation

Prior to starting the study, teachers had been trained in *Reading Mastery Fast Cycle* by SRA/McGraw-Hill (and had 4 years experience with the program). Teachers were trained to implement *Horizons Fast Track* by SRA/McGraw-Hill prior to the start of the school year.

Appendix B: Outcome measures for each domain

Alphabetics	
Letter-word identification construct	
<i>Woodcock-Johnson Psycho-Educational Battery-Revised (WJ-R) Letter-Word Identification subtest</i>	The WJ-R is a nationally-standardized individually-administered battery of cognitive and achievement tests. The Letter-Word Identification subtest measures basic word-reading skills and requires the student to read aloud isolated words that range in frequency and difficulty. The reliability for the Letter-Word Identification subtest is greater than 0.93 (as cited in Cooke et al., 2004).
Word attack construct	
<i>WJ-R Word Attack subtest</i>	The WJ-R is a nationally-standardized individually-administered battery of cognitive and achievement tests. The Word Attack subtest measures the student's ability to apply phonic and structural analysis skills to pronounce unfamiliar words. Phonemic decoding skills are measured by asking students to read pseudowords. Students are aware that the words are not real. The reliability for the Word Attack subtest is greater than 0.87 (as cited in Cooke et al., 2004).
Multiple constructs	
<i>North Carolina Literacy Assessment</i>	The North Carolina Literacy Assessment for grades K–2 has several sections that measure letter and sound identification, book and print awareness, phonemic awareness, fluency, oral retelling, writing about reading, spelling, and writing (as cited in Cooke et al., 2004).
Reading comprehension	
Reading and listening comprehension construct	
<i>WJ-R Passage Comprehension subtest</i>	The WJ-R is a nationally-standardized individually-administered battery of cognitive and achievement tests. The Passage Comprehension subtest is a measure of reading comprehension at the sentence level that uses a cloze procedure. Students read a sentence or short passage and supply missing words based on the overall context. Reliability ranges from 0.87 to 0.97 (as cited in Cooke et al., 2004).

Appendix C.1: Findings included in the rating for the alphabetics domain

Outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
Cooke et al., 2004^a								
<i>WJ-R Letter-Word Identification subtest</i>	Grades 2–4	3 schools/ 30 students	82.30 (18.36)	80.00 (14.82)	2.30	0.13	+5	0.31
<i>WJ-R Word Attack subtest</i>	Grades 2–4	3 schools/ 30 students	85.17 (13.49)	82.64 (15.71)	2.53	0.17	+7	0.32
<i>North Carolina Literacy Assessment</i>	Grades 2–4	3 schools/ 30 students	40.00 (8.28)	41.43 (9.83)	–1.43	–0.15	–6	0.50
Domain average for alphabetics (Cooke et al., 2004)						0.05	+2	Not statistically significant
Domain average for alphabetics across all studies						0.05	+2	na

Table Notes: For mean difference, effect size, and improvement index values reported in the table, a positive number favors the intervention group and a negative number favors the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the average change expected for all students who are given the intervention (measured in standard deviations of the outcome measure). The improvement index is an alternate presentation of the effect size, reflecting the change in an average student’s percentile rank that can be expected if the student is given the intervention. The WWC-computed average effect size is a simple average rounded to two decimal places; the average improvement index is calculated from the average effect size. The statistical significance of the study’s domain average was determined by the WWC. na = not applicable. WJ-R = Woodcock-Johnson Psycho-Educational Battery–Revised.

^a For Cooke et al. (2004), the p-values presented here were reported in the original study. Corrections for clustering and multiple comparisons were needed but did not affect whether any of the contrasts were found to be statistically significant. The WWC calculated the intervention group mean using a difference-in-differences approach (see the WWC Handbook) by adding the impact of the program (difference in mean gains between the intervention and comparison groups) to the unadjusted comparison group posttest means. The WWC calculated and reported effect sizes using Hedges’ *g* rather than Cohen’s *d* that is reported by the study authors. This study is characterized as having an indeterminate effect because no single effect is statistically significant or substantively important and neither is the mean effect. For more information, please refer to the WWC Standards and Procedures Handbook, version 2.1, p. 96.

Appendix C.2: Findings included in the rating for the reading comprehension domain

Outcome measure	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
Cooke et al., 2004^a								
<i>WJ-R Passage Comprehension subtest</i>	Grades 2–4	3 schools/ 30 students	85.29 (21.96)	85.57 (18.27)	–0.28	–0.01	–1	0.92
Domain average for reading comprehension (Cooke et al., 2004)						–0.01	–1	Not statistically significant
Domain average for reading comprehension across all studies						–0.01	–1	na

Table Notes: For mean difference, effect size, and improvement index values reported in the table, a positive number favors the intervention group and a negative number favors the comparison group. The effect size is a standardized measure of the effect of an intervention on student outcomes, representing the average change expected for all students who are given the intervention (measured in standard deviations of the outcome measure). The improvement index is an alternate presentation of the effect size, reflecting the change in an average student’s percentile rank that can be expected if the student is given the intervention. The WWC-computed average effect size is a simple average rounded to two decimal places; the average improvement index is calculated from the average effect size. The statistical significance of the study’s domain average was determined by the WWC. na = not applicable. WJ-R = Woodcock-Johnson Psycho-Educational Battery–Revised.

^a For Cooke et al. (2004), the p-value presented here was reported in the original study. A correction for clustering was needed but did not affect whether any of the contrasts were found to be statistically significant. The WWC calculated the intervention group mean using a difference-in-differences approach (see the WWC Handbook) by adding the impact of the program (difference in mean gains between the intervention and comparison groups) to the unadjusted comparison group posttest means. The WWC calculated and reported effect sizes using Hedges’ *g* rather than Cohen’s *d* that is reported by the study authors. This study is characterized as having an indeterminate effect because no single effect is statistically significant or substantively important and neither is the mean effect. For more information, please refer to the WWC Standards and Procedures Handbook, version 2.1, p. 96.

Endnotes

* On July 16, 2013, the WWC modified this report in response to an independent review by the quality review team. Based on the review, the WWC changed the rating of the Herrera et al. (1997) study from *meets evidence standards without reservations* to *ineligible for review* because it does not provide enough information about its design to assess whether it meets standards. Text and tables were modified to remove the Herrera et al. (1997) study from the body of evidence. This resulted in the following: modification of the Research section; modification to Table 1; modification of the Summary of Effectiveness for the alphabetic domain section and its associated Table 3 Rating of Effectiveness and Extent of Evidence for the alphabetic domain; removal of the section Summary of Effectiveness for the reading fluency domain and the associated Table 4 Rating of Effectiveness and Extent of Evidence for the reading fluency domain; renumbering of Table 5 Rating of Effectiveness and Extent of Evidence for the reading comprehension domain; removal of Summary of Effectiveness for the writing domain and its associated table; modification to References section; renumbering Appendix A.1 to Appendix A; removal of Appendix A.2 and the associated Table A.2; modification to Appendix B; removal of Appendix C.2 Findings included in the rating for the reading fluency domain; renumbering Appendix C.3 to Appendix C.2 Findings included in the rating for the reading comprehension domain; and removal of Appendix C.4 Findings included in the rating for the writing domain. The WWC has not added studies to the body of evidence or updated the literature search since the July 2012 release of this report.

¹ The descriptive information for this program was obtained from a publicly available source: the program's website (<https://www.mheonline.com>, downloaded June 2011; updated January 2012). The WWC requests developers to review the program description sections for accuracy from their perspective. The program description was provided to the developer in July 2011; however, the WWC received no response. 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 August 2011. The studies in this report were reviewed using the Evidence Standards from the WWC Procedures and Standards Handbook (version 2.1), along with those described in the Students with Learning Disabilities review protocol (version 2.1). The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.

³ For criteria used in the determination of the rating of effectiveness and extent of evidence, see the WWC Rating Criteria on p. 16. These improvement index numbers show the average and range of student-level improvement indices for all findings across the studies.

Recommended Citation

U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse. (2012, July). *Students with Learning Disabilities intervention report: Reading Mastery*. Retrieved from <http://whatworks.ed.gov>

WWC Rating Criteria

Criteria used to determine the rating of a study

Study rating	Criteria
Meets WWC evidence standards without reservations	A study that provides strong evidence for an intervention's effectiveness, such as a well-implemented RCT.
Meets WWC evidence standards with reservations	A study that provides weaker evidence for an intervention's effectiveness, such as a QED or an RCT with high attrition that has established equivalence of the analytic samples.

Criteria used to determine the rating of effectiveness for an intervention

Rating of effectiveness	Criteria
Positive effects	Two or more studies show statistically significant positive effects, at least one of which met WWC evidence standards for a strong design, AND No studies show statistically significant or substantively important negative effects.
Potentially positive effects	At least one study shows a statistically significant or substantively important positive effect, AND No studies show a statistically significant or substantively important negative effect AND fewer or the same number of studies show indeterminate effects than show statistically significant or substantively important positive effects.
Mixed effects	At least one study shows a statistically significant or substantively important positive effect AND at least one study shows a statistically significant or substantively important negative effect, but no more such studies than the number showing a statistically significant or substantively important positive effect, OR At least one study shows a statistically significant or substantively important effect AND more studies show an indeterminate effect than show a statistically significant or substantively important effect.
Potentially negative effects	One study shows a statistically significant or substantively important negative effect and no studies show a statistically significant or substantively important positive effect, OR Two or more studies show statistically significant or substantively important negative effects, at least one study shows a statistically significant or substantively important positive effect, and more studies show statistically significant or substantively important negative effects than show statistically significant or substantively important positive effects.
Negative effects	Two or more studies show statistically significant negative effects, at least one of which met WWC evidence standards for a strong design, AND No studies show statistically significant or substantively important positive effects.
No discernible effects	None of the studies shows a statistically significant or substantively important effect, either positive or negative.

Criteria used to determine the extent of evidence for an intervention

Extent of evidence	Criteria
Medium to large	The domain includes more than one study, AND The domain includes more than one school, AND The domain findings are based on a total sample size of at least 350 students, OR, assuming 25 students in a class, a total of at least 14 classrooms across studies.
Small	The domain includes only one study, OR The domain includes only one school, OR The domain findings are based on a total sample size of fewer than 350 students, AND, assuming 25 students in a class, a total of fewer than 14 classrooms across studies.

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 Rating Criteria on p. 16.
Improvement index	Along a percentile distribution of students, the improvement index represents the gain or loss of the average student due to the intervention. As the average student starts at the 50th percentile, the measure ranges from -50 to +50.
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 subjects 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 investigators randomly assign eligible participants into 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 Rating Criteria on p. 16.
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.
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% ($p < 0.05$).
Substantively important	A substantively important finding is one that has an effect size of 0.25 or greater, regardless of statistical significance.

Please see the [WWC Procedures and Standards Handbook \(version 2.1\)](#) for additional details.