

What Works Clearinghouse



Stepping Stones to Literacy

Program description¹ *Stepping Stones to Literacy (SSL)* is a supplemental curriculum designed to promote listening, print conventions, phonological awareness, phonemic awareness, and serial processing/rapid naming (quickly naming familiar visual symbols and stimuli such as letters or colors). The program targets kindergarten and older

preschool students considered to be underachieving readers, based on teacher’s recommendations, assessments, and systematic screening. Students participate in 10- to 20-minute daily lessons in a small group or individually. The curriculum consists of 25 lessons, for a total of 9–15 hours of instructional time.

Research Two studies of *Stepping Stones to Literacy* met the What Works Clearinghouse (WWC) evidence standards. The two studies included 120 kindergarten students in 17 elementary schools in the Midwest.² The WWC considers the extent of evidence

for *Stepping Stones to Literacy* to be small for alphabetics. No studies that met WWC evidence standards with or without reservations addressed fluency, comprehension, or general reading achievement.

Effectiveness *Stepping Stones to Literacy* was found to have positive effects on student outcomes in the alphabetics domain.

	Alphabetics	Fluency	Comprehension	General reading achievement
Rating of effectiveness	Positive	na	na	na
Improvement index³	Average: +30 percentile points Range: +14 to +40 percentile points	na	na	na

na = not applicable

1. The descriptive information for this program was obtained from publicly available sources: the program’s website (www.stepsstonesitoliteracy.com); downloaded March, 2007) and the research literature (Nelson, Benner, & Gonzalez, 2003; Nelson, Stage, Epstein, & Pierce, 2005). 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.
2. The evidence presented in this report is based on available research. Findings and conclusions may change as new research becomes available.
3. These numbers show the average and range of improvement indices for all findings across the study.

Additional program information⁴

Developer and contact

Developed by J. Ron Nelson, Penny Cooper, and Jorge Gonzalez, *Stepping Stones to Literacy* is distributed by Sopris West. Address: 4093 Specialty Place, Longmont, CO 80504. Email: customerservice@sopriswest.com. Web: www.sopriswest.com. Telephone: (800) 547-6747.

Scope of use

No information on the scope of use or the demographic characteristics of program users is available.

Teaching

Stepping Stones to Literacy (SSL) comprises twenty-five, 10- to 20-minute lessons that supplement the regular reading curriculum. In each lesson, the teacher guides students through four to six sequenced activities to help students master five critical early literacy skill sets: listening, print conventions, phonological awareness, phonemic awareness, and serial processing/rapid naming. Students without deficits or with mild to moderate early

literacy deficits are usually taught in small groups; students with significant early literacy deficits are taught individually. The curriculum includes a lesson book, with a separate section on serial rapid automatic naming activities (where children practice making quick visual-verbal associations of known sets of colors, numbers, and/or letter names in a left-to-right format), and instructional prompts in English and Spanish.

Each of the 25 lessons begins with a set of nursery rhymes and follows with a set of sequenced instructional activities. Teachers use the model-lead-test instructional format. The teacher first models the target skill. Students replicate the example and practice the skill with assistance from the teacher. Teachers monitor student progress and re-teach the skill to students who do not fully master it. Lessons can also be repeated to help students fully master the early literacy skills taught.

Cost

The SSL kit is available from Sopris West for \$223.49, which includes the lesson book and the instructor's guide.

Research

Two studies reviewed by the WWC investigated the effects of *Stepping Stones to Literacy*. Both studies (Nelson, Cooper, & Gonzalez, 2005; Nelson, Stage, Epstein, & Pierce, 2005) were randomized controlled trials that met WWC evidence standards.

The Nelson, Benner, & Gonzalez (2005) study included 36 kindergarten students from seven schools in a Midwestern city. Students were randomized to intervention and comparison groups. The intervention group received SSL in addition to the regular curriculum used in the schools, *Open Court Reading*. The comparison group received the regular curriculum with no additional supplement.

The Nelson, Stage, Epstein, & Pierce (2005) study included 84 kindergarten students from ten schools in the Midwest.

Students were randomized to intervention and comparison groups. The intervention group received SSL in addition to the regular curriculum used by the schools. The comparison group received the regular curriculum with no additional supplement.

Extent of evidence

The WWC categorizes the extent of evidence in each domain as small or moderate to large (see the [What Works Clearinghouse Extent of Evidence Categorization Scheme](#)). The extent of evidence takes into account the number of studies and the total sample size across the studies that met WWC evidence standards with or without reservations.⁵

4. The descriptive information for this program was obtained from publicly available sources: the program's website (www.steppingstonestoliteracy.com; downloaded March, 2007) and the research literature (Nelson, Benner, & Gonzalez, 2003; Nelson, Stage, Epstein, & Pierce, 2005). 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.
5. The Extent of Evidence Categorization was developed to tell readers how much evidence was used to determine the intervention rating, focusing on the number and size of studies. Additional factors associated with a related concept, external validity, such as the students' demographics and the types of settings in which studies took place, are not taken into account for the categorization.

Research *(continued)*

The WWC considers the extent of evidence for *Stepping Stones to Literacy* to be small for alphabets. No studies that met WWC evidence standards with or without reservations

addressed fluency, comprehension, or general reading achievement.

Effectiveness Findings

The WWC review of interventions for beginning reading addresses student outcomes in four domains: alphabets, fluency, comprehension, and general reading achievement. Both studies reviewed for this WWC intervention report addressed outcomes for constructs in the alphabets domain.⁶

Alphabets: The Nelson, Benner, & Gonzalez (2005) study findings for alphabets are based on the performance of SSL students and comparison students on:

- Three measures of phonological awareness (Comprehensive Test of Phonological Processing (CTOPP): Phonological Awareness subtest and Dynamic Indicators of Basic Early Literacy Skills (DIBELS): Phoneme Segmentation Fluency and Initial Sound Fluency subtests).
- One measure of letter knowledge (DIBELS: Letter Naming Fluency subtest).
- One measure of phonics (DIBELS: Nonsense Words Fluency subtest).

The authors found and the WWC confirmed statistically significant positive effects of SSL on all outcomes.

The Nelson, Stage, Epstein, & Pierce (2005) study findings for alphabets are based on the performance of SSL and comparison students on:

- One measure of phonological awareness (CTOPP: Phonological Awareness subtest).
- One measure of letter knowledge (DIBELS: Letter Naming Fluency subtest).
- Two measures of phonics (Woodcock Reading Mastery Test-Revised: Word Identification and Word Attack subtests).

The authors found and the WWC confirmed statistically significant positive effects of SSL on all outcomes

Rating of effectiveness

The WWC rates the effects of an intervention in a given outcome domain as positive, potentially positive, mixed, no discernible effects, potentially negative, or negative. The rating of effectiveness takes into account four factors: the quality of the research design, the statistical significance of the findings,⁷ the size of the difference between participants in the intervention and the comparison conditions, and the consistency in findings across studies (see the [WWC Intervention Rating Scheme](#)).

The WWC found *Stepping Stones to Literacy* to have positive effects for alphabets

Improvement index

The WWC computes an improvement index for each individual finding. In addition, within each outcome domain, the WWC computes an average improvement index for each study and an average improvement index across studies (see [Technical Details of WWC-Conducted Computations](#)). The improvement

index represents the difference between the percentile rank of the average student in the intervention condition versus the percentile rank of the average student in the comparison condition. Unlike the rating of effectiveness, the improvement index is based entirely on the size of the effect, regardless of the statistical significance of the effect, the study design, or the

6. For definitions of the domains and constructs, see the [Beginning Reading Protocol](#).

7. The level of statistical significance was reported by the study authors or, where necessary, calculated by the WWC to correct for clustering within classrooms or schools and for multiple comparisons. For an explanation, see the [WWC Tutorial on Mismatch](#). See the [Technical Details of WWC-Conducted Computations](#) for the formulas the WWC used to calculate the statistical significance. In the case of SSL no corrections for clustering or multiple comparisons were needed.

The WWC found *Stepping Stones to Literacy* to have positive effects for alphabetics *(continued)*

analyses. The improvement index can take on values between -50 and +50, with positive numbers denoting results favorable to the intervention group.

The average improvement index for alphabetics is +30 percentile points across the two studies, with a range of +14 to +40 percentile points across findings.

Summary

The WWC reviewed two studies on SSL. Both studies met the WWC evidence standards. Based on these two studies, the WWC found positive effects in the alphabetics domain. The evidence presented in this report may change as new research emerges.

References

Met WWC evidence standards

Nelson, J. R., Benner, G. J., & Gonzalez, J. (2005). An investigation of the effects of a prereading intervention on the early literacy skills of children at risk of emotional disturbance and reading problems. *Journal of Emotional and Behavioral Disorders, 13*(1), 3–12.

Additional source:

Nelson, J. R., Cooper, P., & Gonzales, J. (2003). *Stepping Stones to Literacy: What Works Clearinghouse submission*. (Available from the Center for At-Risk Children's Services, 202 Barkley Center, Lincoln, NE 68583-0732)
Nelson, J. R., Stage, S. A., Epstein, M. H., & Pierce, C. D. (2005). Effects of a prereading intervention on the literacy and social skills of children. *Exceptional Children, 72*(1), 29–45.

For more information about specific studies and WWC calculations, please see the [WWC Stepping Stones to Literacy Technical Appendices](#).

Appendix

Appendix A1.1 Study characteristics: Nelson, Benner, & Gonzales, 2005 (randomized controlled trial)

Characteristic	Description
Study citation	Nelson, J. R., Benner, G. J., & Gonzalez, J. (2005). An investigation of the effects of a prereading intervention on the early literacy skills of children at risk of emotional disturbance and reading problems. <i>Journal of Emotional and Behavioral Disorders, 13</i> (1), 3–12.
Participants	Forty-two kindergarten students with behavior problems were randomly assigned to either the intervention (<i>Stepping Stones to Literacy</i>) or the comparison condition. Three students who were performing at or above average with respect to phonological awareness skills were removed from each condition. Therefore, the analysis included 36 students (18 students per condition). Most of the participants were male students (17 males and one female in each condition). Minority students were 44% of the intervention group and 34% of the comparison group. The percentages of students eligible for free/reduced price lunch were 72% and 44% in the intervention and comparison groups, respectively. One student in each condition was an English language learner.
Setting	The study took place in seven elementary schools in a medium-sized Midwestern city.
Intervention	Over a five-week period, intervention group students received <i>Stepping Stones to Literacy</i> as a supplement to the core curriculum (<i>Open Court Reading</i> and early literacy developmental activities designed by the classroom teachers). The <i>Stepping Stones to Literacy</i> program consisted of twenty-five 20-minute one-on-one daily tutoring lessons. According to reports by tutors and independent observers, the tutoring sessions were implemented with a high level of fidelity to the <i>Stepping Stones to Literacy</i> curriculum.
Comparison	Comparison group students received the core curriculum and no other supplemental instruction. The study indicated that no attempt was made to change any of the teachers' regular instructional practices in the classroom.
Primary outcomes and measurement	The primary outcome measures were the Comprehensive Test of Phonological Processing (CTOPP): Phonological Awareness subtest and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS): Initial Sound Fluency, Phoneme Segmentation Fluency, Letter Naming Fluency, and Nonsense Words Fluency subtests (see Appendix A2 for more detailed descriptions of outcome measures).
Teacher training	Information on training of tutors was not reported in the study.

Appendix A1.2 Study characteristics: Nelson, Stage, Epstein, & Pierce, 2005 (randomized controlled trial)

Characteristic	Description
Study citation	Nelson, J. R., Stage, S. A., Epstein, M. H., & Pierce, C. D. (2005). Effects of a prereading intervention on the literacy and social skills of children. <i>Exceptional Children</i> , 72(1), 29–45.
Participants	Participants were 84 kindergarten students (64 in the intervention group and 20 in the comparison group) from 27 classrooms. Students were randomly assigned to conditions. ¹ All students had behavior problems, which were identified based on high scores on a measure developed by Walker, Severson, & Gates (1995; as cited in Nelson, Stage, Epstein, & Pierce, 2005) to indicate risk for behavioral disorders. The second criterion for participating in the study was a low score on the DIBELS Letter Naming Fluency subtest. The analysis sample included 47 students in the intervention group and 16 students in the comparison group. ² For the analysis sample, the study reported that 75% of the participants were male students, and about 26% were ethnic minority students. In addition, about 44% of the sample qualified for the free/reduced lunch program.
Setting	The participating students attended 10 elementary schools in the Midwest.
Intervention	The intervention was implemented during tutoring sessions, which were a supplement to the regular curriculum used at the schools. According to reports by tutors and independent observers, the tutoring sessions were implemented with a high level of fidelity.
Comparison	No information was provided for the comparison group other than that this group did not receive SSL services. The study indicated that no attempt was made to change any of the teachers' regular instructional practices in the classroom.
Primary outcomes and measurement	Primary outcome measures included the Comprehensive Test of Phonological Processing (CTOPP): Phonological Awareness subtest, the Dynamic Indicators of Basic Early Literacy Skills: Letter Naming Fluency subtest, and the Woodcock Reading Mastery Test–Revised: Word Identification and Word Attack subtests (see Appendix A2 for more detailed descriptions of outcome measures).
Teacher training	Information on training of tutors was not reported in the study.

1. The WWC has requested and received from the study author additional information about the assignment process. According to the first study author, 20 students' identification numbers were randomly selected from the eligible sample and assigned to the comparison group. The remaining students were assigned to the intervention group.
2. In keeping with the [Beginning Reading Protocol](#), the WWC examined pretest/baseline scores and standard deviations of the post-attrition sample. The groups were similar at baseline (based on the WWC beginning reading review's convention of a mean difference less than 0.50 SD) and the study was not downgraded due to attrition.

Appendix A2 Outcome measures in the alphabetic domain by construct

Characteristic	Description
Phonological awareness	
Comprehensive Test of Phonological Processing (CTOPP): Phonological Awareness	A norm-referenced assessment that provides an overall measure of a child's phonological awareness skills. The composite score, which is based on three subtests, was used for rating purposes. The Elision subtest includes 20 items that measure the extent to which a child can say a word and then say what is left after dropping out designated sounds. The Blending Words subtest includes 20 items that measure a child's skill in blending separately presented sounds together to form words. The Sound Matching subtest includes 20 items that measure a child's skill in matching sounds (as cited in Nelson, Benner, & Gonzalez, 2005 and Nelson, Stage, Epstein, & Pierce, 2005).
Dynamic Indicators of Basic Early Literacy Skills (DIBELS): Phoneme Segmentation Fluency subtest	This standardized test measures a child's ability to segment three- and four-phoneme words into their individual phonemes fluently. The child is presented with words orally and asked to produce verbally the individual phonemes for each word (as cited in Nelson, Benner, & Gonzalez, 2005).
DIBELS: Initial Sound Fluency subtest	This standardized test measures a child's ability to identify the initial sound in an orally presented word. The child is presented with four pictures and associated names and asked to identify (by pointing to or naming) the picture that starts with the same sound presented orally by the examiner (as cited in Nelson, Benner, & Gonzalez, 2005).
Letter knowledge	
DIBELS: Letter Naming Fluency subtest	This is a subtest of a standardized measure in which students are presented with a page of upper- and lower-case letters arranged in a random order and are asked to name as many letters as they can. The score is the number of letters named correctly in one minute (as cited in Nelson, Benner, & Gonzalez, 2005 and in Nelson, Stage, Epstein, & Pierce, 2005).
Phonics	
DIBELS: Nonsense Words Fluency subtest	This subtest measures a child's word reading ability, including letter-sound correspondence and the ability to blend letter sounds into words (as cited in Nelson, Benner, & Gonzalez, 2005).
Woodcock Reading Mastery Test–Revised (WRMT–R): Word Identification subtest	This is a subtest of the norm-referenced WRMT–R. It includes 51 items that test decoding skills. It requires the child to read aloud isolated real words that range in frequency and difficulty (as cited in Nelson, Stage, Epstein, & Pierce, 2005).
WRMT–R: Word Attack subtest	This is a subtest of the norm-referenced WRMT–R. It includes 106 items that measure the child's ability to decode nonsense words. Students are aware that the words are not real (as cited in Nelson, Stage, Epstein, & Pierce, 2005).

Appendix A3 Summary of study findings included in the rating for the alphabetics domain by construct¹

Outcome measure	Study sample	Sample size (schools/ students)	Authors' findings from the study					
			Mean outcome (standard deviation ²)		Mean difference ³ (SSL – comparison)	WWC calculations		
			SSL group	Comparison group		Effect size ⁴	Statistical significance ⁵ (at $\alpha = 0.05$)	Improvement index ⁶
Construct: Phonological awareness								
Nelson, Benner, & Gonzalez, 2005 (randomized controlled trial)⁷								
CTOPP: Phonological Awareness	Kindergarten (low-achievers with behavior problems)	7/36	98.24 (9.40)	90.90 (9.60)	7.34	0.76	Statistically significant	+28
DIBELS: Phoneme Segmentation Fluency	Kindergarten (low-achievers with behavior problems)	7/36	19.43 (8.10)	11.20 (14.60)	8.23	0.68	Statistically significant	+25
DIBELS: Initial Sound Fluency	Kindergarten (low-achievers with behavior problems)	7/36	21.31 (7.90)	11.30 (7.60)	10.01	1.26	Statistically significant	+40
Nelson, Stage, Epstein, & Pierce, 2005 (randomized controlled trial)⁷								
CTOPP: Phonological Awareness	Kindergarten (low-achievers with behavior problems)	10/63	96.10 (11.50)	90.40 (10.50)	5.70	0.50	Statistically significant	+19
Construct: Letter knowledge								
Nelson, Benner, & Gonzalez, 2005 (randomized controlled trial)⁷								
DIBELS: Letter Naming Fluency	Kindergarten (low-achievers with behavior problems)	7/36	25.18 (10.60)	19.90 (16.90)	5.28	0.37	Statistically significant	+14
Nelson, Stage, Epstein, & Pierce, 2005 (randomized controlled trial)⁷								
DIBELS: Letter Naming Fluency	Kindergarten (low-achievers with behavior problems)	10/63	37.70 (14.70)	22.00 (13.40)	15.70	1.08	Statistically significant	+36

(continued)

Appendix A3 Summary of study findings included in the rating for the alphabetics domain by construct *(continued)*

Outcome measure	Study sample	Sample size (schools/ students)	Authors' findings from the study					
			Mean outcome (standard deviation ²)		WWC calculations			
			SSL group	Comparison group	Mean difference ³ (SSL – comparison)	Effect size ⁴	Statistical significance ⁵ (at $\alpha = 0.05$)	Improvement index ⁶
Construct: Phonics								
Nelson, Benner, & Gonzalez, 2005 (randomized controlled trial)⁷								
DIBELS: Nonsense Words Fluency	Kindergarten (low-achievers with behavior problems)	7/36	12.34 (10.00)	3.90 (7.30)	8.44	0.94	Statistically significant	+33
Nelson, Stage, Epstein, & Pierce, 2005 (randomized controlled trial)⁷								
WRMT–R: Word Identification	Kindergarten (low-achievers with behavior problems)	10/63	104.80 (10.50)	94.30 (8.40)	10.50	1.03	Statistically significant	+35
WRMT–R: Word Attack	Kindergarten (low-achievers with behavior problems)	10/63	105.30 (10.60)	96.2 (9.80)	9.10	0.86	Statistically significant	+31
Average⁸ for alphabetics (Nelson, Benner, & Gonzales, 2005)						0.80	Statistically significant	+29
Average⁸ for alphabetics (Nelson, Stage, Epstein, & Gonzales, 2005)						0.87	Statistically significant	+31
Domain average⁸ for alphabetics across all studies						0.84	na	+30

na = not applicable

1. This appendix reports findings considered for the effectiveness rating and the average improvement indices.
2. The standard deviation across all students in each group shows how dispersed the participants' outcomes are: a smaller standard deviation on a given measure would indicate that participants had more similar outcomes.
3. Positive differences and effect sizes favor the intervention group; negative differences and effect sizes favor the comparison group. The SSL group mean equals the comparison group mean plus the mean difference between the groups. The computation of the mean difference took into account the pretest difference between the study groups.
4. For an explanation of the effect size calculation, see [Technical Details of WWC-Conducted Computations](#).
5. Statistical significance is the probability that the difference between groups is a result of chance rather than a real difference between the groups.
6. The improvement index represents the difference between the percentile rank of the average student in the intervention condition versus the percentile rank of the average student in the comparison condition. The improvement index can take on values between –50 and +50, with positive numbers denoting results favorable to the intervention group.
7. The level of statistical significance was reported by the study authors or, where necessary, calculated by the WWC to correct for clustering within classrooms or schools and for multiple comparisons. For an explanation about the clustering correction, see the [WWC Tutorial on Mismatch](#). See [Technical Details of WWC-Conducted Computations](#) for the formulas the WWC used to calculate statistical significance. In the case of Nelson, Benner, & Gonzalez (2005) and Nelson, Stage, Epstein, & Pierce (2005), no corrections for clustering were needed. In addition, no corrections for multiple comparisons were needed as the study reported on level of statistical significance after Bonferonni corrections.
8. The WWC-computed average effect sizes for each study and for the domain across studies are simple averages rounded to two decimal places. The average improvement indices are calculated from the average effect sizes.

Appendix A4 *Stepping Stones to Literacy* rating for the alphabetics domain

The WWC rates an intervention's effects in a given outcome domain as positive, potentially positive, mixed, no discernible effects, potentially negative, or negative.¹

For the outcome domain of alphabetics, the WWC rated *Stepping Stones to Literacy* as having positive effects. The other ratings (potentially positive effects, mixed effects, potentially negative effects, and negative effects) were not considered because *Stepping Stones to Literacy* was assigned the highest applicable rating.

Rating received

Positive effects: Strong evidence of a positive effect with no overriding contrary evidence.

- Criterion 1: Two or more studies showing statistically significant *positive* effects, at least one of which met WWC evidence standards for a strong design.

Met. Two studies of *Stepping Stones to Literacy* showed statistically significant positive effects. Both studies met the WWC evidence standards for a strong design.

and

- Criterion 2: No studies showing statistically significant or substantively important *negative* effects.

Met. No studies showed indeterminate or negative effects.

1. For rating purposes, the WWC considers the statistical significance of individual outcomes and the domain-level effect. The WWC also considers the size of the domain-level effect for ratings of potentially positive or potentially negative effects. See the [WWC Intervention Rating Scheme](#) for a complete description.

Appendix A5 Extent of evidence by domain

Outcome domain	Number of studies	Sample size		Extent of evidence ¹
		Schools	Students	
Alphabets	2	17	120	Small
Fluency	0	0	0	na
Comprehension	0	0	0	na
General reading achievement	0	0	0	na

na = not applicable/not studied

1. A rating of “moderate to large” requires at least two studies and two schools across studies in one domain and a total sample size across studies of at least 350 students or 14 classrooms. Otherwise, the rating is “small.”