

American Indian English Learners Evidence Review

Date: May 21, 2020
To: Southwest English Learners Partnership
From: Regional Educational Laboratory (REL) Southwest
Re: Using the non-regulatory Every Student Succeeds Act (ESSA) standards to assess the level of evidence in: Educational strategies for American Indian students

In support of the *Training on Instructional Practices for American Indian English Learners* project, REL Southwest conducted an evidence review to identify instructional programs, methods, materials, and resources that are effective for teaching and learning of academic subjects, including English language arts, math, science and social sciences, and effective in incorporating relevant cultural traditions and pedagogy.

Findings

The evidence review identified one study as meeting strong evidence standards. This study focused on the relationship between culturally responsive curriculum and instruction and student mathematics achievement. This study is:

Kisker, E., Lipka, J., Adams, B., Rickard, A., Andrew-Ihrke, Yanez, E. & Millard, A. (2012). The potential of a culturally based supplemental mathematics curriculum to improve the mathematics performance of Alaska Native and other students. *Journal for Research in Mathematics Education*, 42(1), 75-113.¹

REL Southwest determined that Kisker et., al (2012) provides strong evidence for the intervention because the study meets the following criteria:

- This study is a well-designed and well-implemented experimental study that *Meets What Works Clearinghouse Standards without Reservations*.² A total of 52 schools were randomized to treatment and comparison conditions, with 2 schools dropping out prior to learning their group assignment. The study has low school-level and student-level attrition, and no joiners are included in the analyses.
- It shows a statistically significant and favorable effect of the intervention on researcher-created mathematics assessments including on the measurement and representing data, and the grouping and place value subtests.
- The favorable effects were not overridden by statistically significant and negative (i.e., unfavorable) evidence on that intervention from findings in studies that meet the WWC evidence standards with or without reservations or are the equivalent quality for making causal inferences.
- The study includes a large, multi-site sample overlapping with populations and settings of interest.

The evidence review also identified two studies as meeting promising evidence standards. Both studies focused on relationships between culturally responsive instruction and student mathematics achievement. These studies are:

¹ <https://eric.ed.gov/?id=EJ978873>

² The completed evidence template used for REL Southwest's review of Kisker et. al (2012) is in appendix B of this memo.

Hilberg, R. S., Tharp, R. G., & DeGeest, L. (2000). The efficacy of CREDE’s standards-based instruction in American Indian mathematics classes. *Equity & Excellence in Education*, 33(2), 32–40.³

REL Southwest determined that Hilberg, Tharp, and DeGeest (2000) provides promising evidence for the intervention because the study meets the following criteria:⁴

- This study is a well-designed and well-implemented correlational study with statistical controls for selection bias on the intervention. The study identifies a comparison group and includes the mathematics pretest and a general measure of achievement (Iowa Test of Basic Skills standardized achievement scores) in the analytic models.
- It shows a statistically significant and favorable effect of the intervention on retention of mathematics concepts knowledge.
- The findings of the studies were not overridden by statistically significant and negative (i.e., unfavorable) evidence on that intervention from findings in studies that meet the WWC evidence standards with or without reservations or are the equivalent quality for making causal inferences.

Lipka, J., & Adams, B. (2004). *Culturally-based math education as a way to improve Alaska Native students’ math performance* (Working Paper No. 20). Athens, OH: Appalachian Collaborative Center for Learning, Assessment, and Instruction in Mathematics.

REL Southwest determined that Lipka and Adams (2004) provide promising evidence for the intervention because the study meets the following criteria:⁵

- It is a correlational study including a treatment and comparison group. The authors controlled for pretest and school setting in the analyses. However, WWC has determined that this study did not meet standards because the outcome measure (an author-created mathematics assessment) does not meet WWC requirements (<https://ies.ed.gov/ncee/wwc/Study/82347>). Additionally, although the study was conducted as a randomized controlled trial, the authors stated that they violated random assignment by assigning two teachers who had previously taught the curriculum to the treatment group.
- It shows a statistically significant and favorable effect of the intervention on the outcomes of interest—mathematics achievement.
- The favorable effects are not overridden by any statistically significant, unfavorable effects of the intervention found either in this study or any other identified at the same time for review on the *Building a Fish Rack* curriculum.

Summaries of each study are included in appendix A. Completed evidence review templates for each study are included in appendix B.

Screening

REL Southwest conducted a literature review to locate journal articles, reports, and other research-based documents focused on instructional practices for American Indian English learners; systematically review relevant studies; classify the quality of the studies using a predetermined rubric; and synthesize the evidence findings. Literature for the review was located using the following search terms:

³ https://manoa.hawaii.edu/coe/crede/wp-content/uploads/Hilberg_Tharp_DeGeest1.pdf

⁴ The completed evidence template used for REL Southwest’s review of Hilberg, Tharp, & DeGeest (2000) is in appendix B of this memo.

⁵ The completed evidence template used for REL Southwest’s review of Lipka and Adams (2004) is in appendix B of this memo.

- “American Indian” OR “Native American” OR “Native North American” OR “Alaska Native” OR “Indigenous American” OR “Indigenous people” OR “Native people”
- AND
- “instructional practices” OR “linguistic development” OR “language development” OR “cultural traditions” OR “cultural pedagogy” OR “academic English” OR “culturally responsive schooling” OR “culturally responsive instruction”

Searches using these terms were conducted using online databases and websites of centers and organizations that are focused on American Indian education. To search for journals, books, and published reports, REL Southwest staff used the EBSCO and the SAGE Journals databases. Within EBSCO, REL Southwest staff used the Academic Search Premier, Education Research Complete, Education Source, ERIC, and SocINDEX databases. To locate reports from research organizations, policy centers, and other entities that conduct, fund, or promote research on instructional strategies for American Indian students, REL Southwest searched the websites of the RELs (<https://ies.ed.gov/ncee/edlabs/>), the Center on Standards and Assessment Implementation (<https://www.csai-online.org/>), and the National Clearinghouse for English Language Acquisition (<https://ncela.ed.gov/>).

REL Southwest reviewed the literature located through the search to determine whether the study should be included in the evidence review summary. To be included in the evidence review summary, studies had to meet the following qualifications:

- Were conducted within the last 20 years
- Described strategies for teaching and learning academic subjects
- Described strategies for incorporating relevant cultural traditions and pedagogy
- Included a treatment group and a comparison group

Review

REL Southwest staff compared each identified study to the criteria included on an IES-developed template (see Appendix B). The IES-developed template includes criteria related to each of the components included in the ESSA levels of evidence shown in Table 1.

Table 1. ESSA levels of evidence

	Strong evidence	Moderate evidence	Promising evidence	Demonstrates a rationale
Study design	Experimental study	Quasi-experimental study	Correlational study with statistical controls for selection	Provides a well-specified logic model informed by research or evaluation
WWC standard	Meets WWC evidence standards without reservations	Meets WWC evidence standards with or without reservations	N/A	N/A

	Strong evidence	Moderate evidence	Promising evidence	Demonstrates a rationale
Favorable effects	Shows a statistically significant and positive effect of the intervention on a student outcome or other relevant outcome	Shows a statistically significant and positive effect of the intervention on a student outcome or other relevant outcome	Shows a statistically significant and positive effect of the intervention on a student outcome or other relevant outcome	Relevant research or an evaluation that suggests the intervention is likely to improve a student outcome or other relevant outcome
Other effects	Is not overridden by statistically significant and negative evidence from other findings in studies that meet WWC evidence standards with or without reservations	Is not overridden by statistically significant and negative evidence from other findings in studies that meet WWC evidence standards with or without reservations	Is not overridden by statistically significant and negative evidence from other findings in studies that meet WWC evidence standards with or without reservations	An effort to study the effects of the intervention, ideally producing promising evidence or higher, will happen as part of the intervention or is under way elsewhere
Sample size and overlap	Includes a large sample and a multisite sample, overlapping with populations and settings proposed to receive the intervention	Includes a large sample and a multisite sample, overlapping with populations OR settings proposed to receive the intervention	N/A	N/A

Note: This table is based on Table 1 in *Non-Regulatory Guidance: Using Evidence to Strengthen Education Investments*. U.S. Department of Education. (2016). *Non-regulatory guidance: Using evidence to strengthen education investments*. Washington, DC: Author.

Appendix A. Study summaries

Kisker, E., Lipka, J., Adams, B., Rickard, A., Andrew-Ihrke, Yanez, E. & Millard, A. (2012). The potential of a culturally based supplemental mathematics curriculum to improve the mathematics performance of Alaska Native and other students. *Journal for Research in Mathematics Education*, 42(1), 75-113.

- **Intervention examined in the study.** Math in a Cultural Context (MCC)—Picking Berries and Going to Egg Island modules. Information about the intervention can be found on pages 79-81 (<https://www.jstor.org/stable/10.5951/jresematheduc.43.1.0075?seq=1>).
- **Specified outcome(s) of interest.** Mathematics achievement on researcher-designed assessments. The Picking Berries assessment included items targeting measurement, representing data, interpreting data, and numeration. The Going to Egg Island assessment included items targeting: grouping, place value, and numeration.
- **Specified population(s) of interest.** Alaska Native students.
- **Specified setting(s) of interest.** Alaska.

Brief description of the intervention, excerpted from Kisker et. al (2012). Math in a Cultural Context (MCC) modules incorporate cultural activities. The Going to Egg Island: Adventures in Grouping and Place Values and Picking Berries: Connections Between Data, Graphing, and Measuring modules included in this study connect mathematical concepts with everyday activities. Each MCC module includes a teacher's manual, CD-ROM, Yup'ik glossary and other materials such as case examples showing effective implementation of MCC lessons. The modules incorporate storybooks that establish the context for the math activities. Each module is designed to be completed in six weeks. In this study, teachers were also provided with a professional development component. The professional development component consisted of two weekend-long workshops (one for each module) and three two-hour audio conferences each semester. The professional development workshops explained the purpose of the study, introduced the curriculum and pedagogical approach, and demonstrated how the curriculum connected to Yup'ik and indigenous cultures.

Who participated in the study. The study involved primarily Alaska Native (45%) and white (33%) grade 2 students from 50 schools located in Southwest Alaska (primarily Yup'ik), Western Alaska (primarily Inupiaq), Interior Alaska (primarily Athabaskan) and urban Alaska. There were 694 students included in the analyses for the Picking Berries module and 703 students included in the analyses for the Going to Egg Island Module.

What the study found. According to Kisker et. Al (2012), the *Picking Berries* module of the MCC supplemental curriculum significantly improved students' performance on the fall test of mathematics concepts that included questions testing students' understanding of numeration, measurement, interpreting data, and representing data, while the *Going to Egg Island* module of the MCC supplemental curriculum significantly improved students' performance on the spring test of mathematics concepts that covered numeration, grouping, and place value. Details regarding these findings can be found on pages 93–95. Additional analyses examining subscores showed that the *Picking Berries* module significantly improved the gains students made in their understanding of both measurement and representing data, and the *Going to Egg Island* module significantly improved the gains students made in their understanding of grouping and place value. Details regarding these findings can be found on pages 95–96.

Caveats. The study also conducted subgroup analyses separately for Alaska Native and other students (Alaska Native students comprise one-half of the study sample). The study reported a statistically, significant, and positive effect for the Alaska Native students, but the authors did not include analytic sample sizes for treatment or comparison schools or students for this subgroup so we cannot assess

whether the subgroup findings meet WWC standards. The authors also did not include gain scores separately for treatment and comparison subgroups of students. Only the impacts for subgroups adjusted for clustering are provided for the *Picking Berries* and *Going to Egg Island* assessments. For this reason, the subgroup analyses meet promising evidence standards. The use of researcher-created assessments is a limitation of the findings. However, the assessments were not determined to be overaligned with the intervention.

Hilberg, R. S., Tharp, R. G., & DeGeest, L. (2000). The efficacy of CREDE's standards-based instruction in American Indian mathematics classes. *Equity & Excellence in Education*, 33(2), 32–40.

- **Intervention examined in the study.** Center for Research on Education, Diversity, and Excellence's (CREDE's) standards-based instruction. Information about the intervention can be found on page 34 of the study (https://manoa.hawaii.edu/coe/crede/wp-content/uploads/Hilberg_Tharp_DeGeest1.pdf).
- **Specified outcome(s) of interest.** Mathematics achievement on a researcher-designed assessment.
- **Specified population(s) of interest.** American Indian students.
- **Specified setting(s) of interest.** Southwestern United States.

Brief description of the intervention, excerpted from Hilberg, Tharp, and DeGeest (2000).

“[CREDE], which researches and develops programs to improve education for at-risk students, developed five general standards for effective pedagogy and two additional standards for American Indian students. CREDE standards...represent a consensus of recommendations for improving teaching and learning from education research across theoretical domains” (p. 32). “Two versions of a mathematics unit on fractions, decimals, and percents were developed jointly by the researcher and the teacher. The experimental unit was taught incorporating CREDE's Standards for Effective Pedagogy” (p. 34).

Who participated in the study. The study involved 31 American Indian grade 8 students from two mathematics classes at a middle school located on a reservation in the Southwestern United States. Three students had repeated at least one grade, and two students were receiving special education services.

What the study found. According to Hilberg, Tharp, and DeGeest (2000), students in the experimental group who received mathematics instruction incorporating CREDE's standards for Effective Pedagogy had statistically significantly higher scores on the author-created math achievement posttest administered three weeks after the conclusion of the unit than students in the comparison group. The study did not find statistically significant differences between students in the treatment and comparison groups on the assessment administered immediately after the unit. However, the authors found that students in the treatment group had statistically significant higher scores than students in the comparison group on the author-created mathematics achievement follow-up posttest administered three weeks after the conclusion of the unit. Details regarding the findings can be found on pages 35–37.

Caveats. Although the study found statistically significant and positive effects of the intervention, the study results should be treated with caution. Although the authors included statistical controls for selection bias, the comparison group likely differed from the experimental group in ways that were not measured in the study. In addition, the study includes a relatively small sample size. Finally, the same teacher taught both the experimental and treatment groups. Therefore, the teacher could affect the outcomes of the study. Moreover, the mathematics achievement test was developed by the research team and may be overaligned with the intervention. Finally, the authors do not provide information about the reliability of their achievement test. Without such information, one cannot be certain that the test is a trustworthy assessment of student knowledge/skill.

Lipka, J., & Adams, B. (2004). *Culturally-based math education as a way to improve Alaska Native students' math performance* (Working Paper No. 20). Athens, OH: Appalachian Collaborative Center for Learning, Assessment, and Instruction in Mathematics.

- **Intervention examined in the study.** The *Building a Fish Rack* curriculum module. Information about the module can be found on pages 8-9 of the study (<https://files.eric.ed.gov/fulltext/ED484849.pdf>)
- **Specified outcome(s) of interest.** Mathematics achievement—a researcher-designed mathematical knowledge test covering shape, perimeter and area.
- **Specified population(s) of interest.** Grade 6 students.
- **Specified setting(s) of interest.** Southwest Alaska.

Brief description of the intervention, excerpted from Lipka and Adams (2004).

“The [Building a Fish Rack] curriculum follows the way some Yup’ik elders construct a fish rack. It asks the students to find the corners of an approximately nine-by-twelve-foot rectangular base. Students cannot use standard measures. Students may use body measures; create their own unit of measure or use small (less than five feet long) locally available materials. This activity unfolds into a series of explorations around what a rectangle is, how students know they have a rectangle (notions of conjecture and proof), other quadrilaterals and how they are related, as well as perimeter and area problems, particularly in dimensions and area when perimeter is held constant. Thus, by connecting a common Yup’ik activity based on the salmon summer fishing season, students were encouraged to learn physical proofs of the properties of a rectangle as they attempted to solve a practical problem—how to determine they have a rectangular base—related to building a structure” (p. 9).

Who participated in the study. The study included 258 Alaska Native grade 6 students in 15 classrooms in Southwestern Alaska. The authors did not present additional descriptive information regarding the characteristics of the students participating in the study.

What the study found. According to Lipka and Adams (2004), students who received the *Building a Fish Rack* curriculum had statistically significant higher scores on an author-created measure of mathematics achievement. Results of the findings are reported on pages 17–19.

Caveats. The outcome measure for the study was a mathematics assessment created by the author and is possibly overaligned with the intervention. WWC determined that the study does not meet the standards because the outcome measure does not meet WWC requirements. The author controlled for pretest and school setting in the study; however, the treatment and comparison groups may have differed in ways that were not measured in the study.

Appendix B. Evidence review template for WWC standards

Template for using What Works Clearinghouse™ (WWC) standards to assess the level of evidence provided by a study or report (Version 2.1, 13 February 2017—for use by WWC-certified reviewers)

Kisker, E., Lipka, J., Adams, B., Rickard, A., Andrew-Ihrke, Yanez, E. & Millard, A. (2012). The potential of a culturally based supplemental mathematics curriculum to improve the mathematics performance of Alaska Native and other students. *Journal for Research in Mathematics Education*, 42(1), 75-113.

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines the effect of Math in a Cultural Context (MCC)—Picking Berries and Going to Egg Island modules
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study clearly describes how the intervention is intended to affect Alaska Native students’ mathematics achievement.
3. Is the study or report one of the following: a. a practice guide prepared by the WWC reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> b. an intervention report prepared by the WWC reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> c. a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that i. uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> ii. reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study uses a school-level randomized controlled trial design in which 52 schools were randomly assigned to treatment and comparison conditions. Two schools dropped out prior to learning of their assignment. The study reports statistically significant and positive findings the <i>Picking Berries</i> assessment and <i>Going to Egg Island</i> assessment. The study also reports statistically significant findings for measurement, representing data, grouping, and place value subtests.

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results?¹</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>The study reports statistically significant and positive findings the <i>Picking Berries</i> assessment and <i>Going to Egg Island</i> assessment. The study also reports statistically significant findings for measurement, representing data, grouping, and place value subtests. These are not overridden by any unfavorable results.</p>
<p>5. Is the study or report one of the following:</p> <ul style="list-style-type: none"> a. a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> b. an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u> c. an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the <i>WWC Handbook</i>²— <ul style="list-style-type: none"> i. at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u> ii. at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i>; <u>and</u> iii. at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³ 	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>The study <i>Meets What Works Clearinghouse Standards without Reservations</i>. A WWC review was conducted by REL Southwest using the 4.0 standards.</p>

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes. The study includes a majority of Alaska Native students (45%). Other students were white (33%) or not identified (12%).
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study reports statistically significant and positive findings the <i>Picking Berries</i> assessment and <i>Going to Egg Island</i> assessment. The study also reports statistically significant findings for measurement, representing data, grouping, and place value subtests. These are not overridden by any unfavorable results.
8. Is the study or report one of the following: a. a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> b. an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <i>or</i> c. an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i> , or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i> ² — i. at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i> ; <u>and</u> ii. at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i> ; <u>and</u> iii. at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes. A WWC review conducted by REL Southwest staff found that the study <i>Meets What Works Clearinghouse Standards without Reservations</i> for the <i>Picking Berries</i> assessment and <i>Going to Egg Island</i> assessment, as well as the subtests—measurement, representing data, grouping, and place value subtests.

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study reports statistically significant and positive findings the <i>Picking Berries</i> assessment and <i>Going to Egg Island</i> assessment, as well as statistically significant findings for measurement, representing data, grouping, and place value subtests, for grade 2 students Alaska Native students in public schools.
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study reports statistically significant and positive findings the <i>Picking Berries</i> assessment and <i>Going to Egg Island</i> assessment, as well as statistically significant findings for measurement, representing data, grouping, and place value subtests. These are not overridden by any unfavorable results.
<p>Mark the highest level of evidence provided by this study or report for the intervention or practice of interest:</p> <p><input type="checkbox"/> Demonstrates a Rationale (1 and 2 must be “Yes”)</p> <p><input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”)</p> <p><input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”)</p> <p><input checked="" type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)</p>		

NOTES

¹(requirements 4, 7, and 10) To see whether any favorable findings of a study or report are overridden by statistically significant and unfavorable findings, consult, in addition to the study or studies or report(s) identified for review, the WWC reviews reported at <https://ies.ed.gov/ncee/wwc/FWW>, <https://ies.ed.gov/ncee/wwc/Publication>, and <https://ies.ed.gov/ncee/wwc/ReviewedStudies>. Focus only on outcomes relevant to the stakeholder. Unless otherwise specified for the purpose of the review, assume the following: If the number of relevant outcomes with statistically significant and *favorable* impacts reviewed and confirmed by you or reported by the WWC is *greater than or equal to* the number of relevant outcomes with statistically significant and *unfavorable* impacts, then the favorable result from the study or report identified for review is *not* overridden. Note in your justification the source of any information on possibly overriding findings: either reported findings from the study itself and any related study identified for review at the same time and on the *same* intervention or practice (for requirement 4); or a review using WWC standards to assess the study and any related study identified for review at the same time on the *same* intervention or practice (for requirements 7 and 10); or a systematic review of evidence reported by the WWC for the *same* intervention or practice (for requirements 4, 7, and 10).

²(requirements 5[c] and 8[c]) To examine whether a single study’s relevant findings have been reviewed previously under Version 2.1 or higher of the WWC *Handbook*, consult <https://ies.ed.gov/ncee/wwc/ReviewedStudies>. If a new assessment using WWC standards is required for a specific study finding, complete a Study Review Guide (SRG) using the most recent WWC *Handbook* (Version 3.0), *Reviewer Guidance*, and *Review of Individual Studies Protocol* available at <https://ies.ed.gov/ncee/wwc/Handbooks>. Note in your justification which conclusions are based on your own study review, as opposed to information reported on the WWC website for a single study review.

³**(requirements 5[c][iii] and 8[c][iii])** *Large sample* means at least 350 individuals in the analytic sample for a relevant finding satisfying the preceding requirements. For cluster design studies, note in the justification the number of clusters—such as schools, teachers, or classrooms—and the total number of individuals included in a relevant finding (guidance released by ED in September 2016 recommended that there be at least 50 clusters, and 500 individuals in a relevant finding from such a study). *Multi-site* sample includes more than one state, school district, or locality (where “locality” can refer to a county, city, or postsecondary campus). “Yes” can be checked if the study under review plus another study identified for review at the same time and on the *same* intervention or practice *together* satisfy the large sample requirement and the multi-site sample requirement, *provided* each study under review also satisfies the *preceding* requirements on the checklist (that is, 1-5[c][ii], or 1-8[c][ii]). If an additional study is needed to satisfy the large sample requirement or the multi-site sample requirement, and that study was also identified for review on the *same* intervention or practice, include in your justifications cross-references to the review numbers for the related studies.

Hilberg, R. S., Tharp, R. G., & DeGeest, L. (2000). The efficacy of CREDE’s standards-based instruction in American Indian mathematics classes. *Equity & Excellence in Education*, 33(2), 32–40.

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines the effect of CREDE’s standards-based instruction on American Indian students’ mathematics achievement.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study clearly describes how the intervention is intended to affect American Indian students’ mathematics achievement.
3. Is the study or report one of the following: a. a practice guide prepared by the WWC reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> b. an intervention report prepared by the WWC reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> c. a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that i. uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> ii. reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>The study uses a correlational design. The authors estimated differences in mathematics achievement between students in treatment and comparison classrooms. Student were not randomly assigned to the treatment condition. The authors included controls for general achievement and the mathematics pretest in the analytic model to statistically control for selection bias.</p> <p>The authors did not present enough information to determine whether the treatment and comparison groups were equivalent at baseline on the mathematics pretest or general achievement.</p>

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results?¹</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>The authors found a statistically significant and positive difference between students in the treatment and comparison conditions on their retention of mathematics concepts, as measured by the mathematics assessment administered three weeks after the conclusion of the unit. However, no statistically significant differences between the groups were found on the mathematics posttest administered immediately following the unit.</p>
<p>5. Is the study or report one of the following:</p> <ul style="list-style-type: none"> a. a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> b. an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u> c. an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the <i>WWC Handbook</i>²— <ul style="list-style-type: none"> i. at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations or Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u> ii. at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i>; <u>and</u> iii. at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³ 	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<p>The study is does not use a design that would be eligible to meet WWC standards with or without reservations.</p>

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
8. Is the study or report one of the following: a. a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> b. an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <i>or</i> c. an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i> , or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i> ² — i. at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i> ; <u>and</u> ii. at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i> ; <u>and</u> iii. at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results?¹</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<p>Mark the highest level of evidence provided by this study or report for the intervention or practice of interest:</p> <p><input type="checkbox"/> <i>Demonstrates a Rationale</i> (1 and 2 must be “Yes”)</p> <p><input checked="" type="checkbox"/> <i>Promising Evidence</i> (1 through 4 must be “Yes”)</p> <p><input type="checkbox"/> <i>Moderate Evidence</i> (1 through 7 must be “Yes”)</p> <p><input type="checkbox"/> <i>Strong Evidence</i> (1 through 10 must be “Yes”)</p>		

NOTES

¹**(requirements 4, 7, and 10)** To see whether any favorable findings of a study or report are overridden by statistically significant and unfavorable findings, consult, in addition to the study or studies or report(s) identified for review, the WWC reviews reported at <https://ies.ed.gov/ncee/wwc/FWW>, <https://ies.ed.gov/ncee/wwc/Publication>, and <https://ies.ed.gov/ncee/wwc/ReviewedStudies>. Focus only on outcomes relevant to the stakeholder. Unless otherwise specified for the purpose of the review, assume the following: If the number of relevant outcomes with statistically significant and *favorable* impacts reviewed and confirmed by you or reported by the WWC is *greater than or equal to* the number of relevant outcomes with statistically significant and *unfavorable* impacts, then the favorable result from the study or report identified for review is *not* overridden. Note in your justification the source of any information on possibly overriding findings: either reported findings from the study itself and any related study identified for review at the same time and on the *same* intervention or practice (for requirement 4); or a review using WWC standards to assess the study and any related study identified for review at the same time on the *same* intervention or practice (for requirements 7 and 10); or a systematic review of evidence reported by the WWC for the *same* intervention or practice (for requirements 4, 7, and 10).

²**(requirements 5[c] and 8[c])** To examine whether a single study’s relevant findings have been reviewed previously under Version 2.1 or higher of the WWC *Handbook*, consult <https://ies.ed.gov/ncee/wwc/ReviewedStudies>. If a new assessment using WWC standards is required for a specific study finding, complete a Study Review Guide (SRG) using the most recent WWC *Handbook* (Version 3.0), *Reviewer Guidance*, and *Review of Individual Studies Protocol* available at <https://ies.ed.gov/ncee/wwc/Handbooks>. Note in your justification which conclusions are based on your own study review, as opposed to information reported on the WWC website for a single study review.

³**(requirements 5[c][iii] and 8[c][iii])** *Large sample* means at least 350 individuals in the analytic sample for a relevant finding satisfying the preceding requirements. For cluster design studies, note in the justification the number of clusters—such as schools, teachers, or classrooms—and the total number of individuals included in a relevant finding (guidance released by ED in September 2016 recommended that there be at least 50 clusters, and 500 individuals in a relevant finding from such a study). *Multi-site* sample includes more than one state, school district, or locality (where “locality” can refer to a county, city, or postsecondary campus). “Yes” can be checked if the study under review plus another study identified for review at the same time and on the *same* intervention or practice *together* satisfy the large sample requirement and the multi-site sample requirement, *provided* each study under review also satisfies the *preceding* requirements on the checklist (that is, 1-5[c][ii], or 1-8[c][ii]). If an additional study is needed to satisfy the large sample requirement or the multi-site sample requirement, and that study was also identified for review on the *same* intervention or practice, include in your justifications cross-references to the review numbers for the related studies.

Lipka, J., & Adams, B. (2004). *Culturally-based math education as a way to improve Alaska Native students' math performance* (Working Paper No. 20). Athens, OH: Appalachian Collaborative Center for Learning, Assessment, and Instruction in Mathematics.

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study looks at relationships between a culturally relevant mathematics curriculum and grade 6 students' mathematics achievement.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study provides a theoretical rationale for why a culturally relevant curriculum would lead to better outcomes for Alaska Native students.
3. Is the study or report one of the following: a. a practice guide prepared by the WWC reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> b. an intervention report prepared by the WWC reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> c. a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that i. uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> ii. reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study uses a randomized controlled trial design comparing outcomes for a treatment and comparison group. The authors randomly assigned teachers to treatment and comparison groups; however, the authors violated random assignment by assigning two teachers who had previously taught the curriculum to the treatment group. The authors found a statistically significant difference between treatment and control group students on a researcher-created measure of students' mathematics achievement. The authors control for differences in the pretest and the school setting (urban versus rural) in the outcomes analyses.

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results?¹</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>At least one relevant finding remains and is not overridden by any unfavorable results.</p>
<p>5. Is the study or report one of the following:</p> <ul style="list-style-type: none"> a. a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> b. an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u> c. an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the <i>WWC Handbook</i>²— <ul style="list-style-type: none"> i. at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u> ii. at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i>; <u>and</u> iii. at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³ 	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<p>The study was reviewed by the WWC and determined not to meet standards because the researcher-created mathematics assessment used to measure student outcomes was determined not to meet WWC requirements.</p>

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
8. Is the study or report one of the following: a. a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> b. an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <i>or</i> c. an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i> , or on the basis of your own study review using Version 3.0 of the <i>WWC Handbook</i> ² — i. at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i> ; <u>and</u> ii. at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i> ; <u>and</u> iii. at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<p>Mark the highest level of evidence provided by this study or report for the intervention or practice of interest:</p> <p><input type="checkbox"/> Demonstrates a Rationale (1 and 2 must be “Yes”)</p> <p><input checked="" type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”)</p> <p><input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”)</p> <p><input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)</p>		

NOTES

¹**(requirements 4, 7, and 10)** To see whether any favorable findings of a study or report are overridden by statistically significant and unfavorable findings, consult, in addition to the study or studies or report(s) identified for review, the WWC reviews reported at <https://ies.ed.gov/ncee/wwc/FWW>, <https://ies.ed.gov/ncee/wwc/Publication>, and <https://ies.ed.gov/ncee/wwc/ReviewedStudies>. Focus only on outcomes relevant to the stakeholder. Unless otherwise specified for the purpose of the review, assume the following: If the number of relevant outcomes with statistically significant and *favorable* impacts reviewed and confirmed by you or reported by the WWC is *greater than or equal to* the number of relevant outcomes with statistically significant and *unfavorable* impacts, then the favorable result from the study or report identified for review is *not* overridden. Note in your justification the source of any information on possibly overriding findings: either reported findings from the study itself and any related study identified for review at the same time and on the *same* intervention or practice (for requirement 4); or a review using WWC standards to assess the study and any related study identified for review at the same time on the *same* intervention or practice (for requirements 7 and 10); or a systematic review of evidence reported by the WWC for the *same* intervention or practice (for requirements 4, 7, and 10).

²**(requirements 5[c] and 8[c])** To examine whether a single study’s relevant findings have been reviewed previously under Version 2.1 or higher of the *WWC Handbook*, consult <https://ies.ed.gov/ncee/wwc/ReviewedStudies>. If a new assessment using WWC standards is required for a specific study finding, complete a Study Review Guide (SRG) using the most recent *WWC Handbook* (Version 3.0), *Reviewer Guidance*, and *Review of Individual Studies Protocol* available at <https://ies.ed.gov/ncee/wwc/Handbooks>. Note in your justification which conclusions are based on your own study review, as opposed to information reported on the WWC website for a single study review.

³**(requirements 5[c][iii] and 8[c][iii])** *Large sample* means at least 350 individuals in the analytic sample for a relevant finding satisfying the preceding requirements. For cluster design studies, note in the justification the number of clusters—such as schools, teachers, or classrooms—and the total number of individuals included in a relevant finding (guidance released by ED in September 2016 recommended that there be at least 50 clusters, and

500 individuals in a relevant finding from such a study). *Multi-site* sample includes more than one state, school district, or locality (where “locality” can refer to a county, city, or postsecondary campus). “Yes” can be checked if the study under review plus another study identified for review at the same time and on the *same* intervention or practice *together* satisfy the large sample requirement and the multi-site sample requirement, *provided* each study under review also satisfies the *preceding* requirements on the checklist (that is, 1-5[c][ii], or 1-8[c][ii]). If an additional study is needed to satisfy the large sample requirement or the multi-site sample requirement, and that study was also identified for review on the *same* intervention or practice, include in your justifications cross-references to the review numbers for the related studies.