

The University of Chicago School Mathematics Project (UCSMP)

Intervention Brief | Primary Mathematics Topic Area

WHAT WORKS CLEARINGHOUSE™

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Mathematics skills are important for academic and workplace success. *University of Chicago School Mathematics Project (UCSMP)* is a core mathematics curriculum that includes materials and a routinized instructional approach with an option for teacher training. The curriculum uses an inquiry-based approach with a focus on active learning where students frequently engage in hands-on activities and small-group activities.

This What Works Clearinghouse (WWC) intervention report, part of the WWC’s Primary Mathematics topic area, explores the effects of *UCSMP* on general mathematics and algebra outcomes. This review focuses on studies of two *UCSMP*

courses that are eligible for review under the Primary Mathematics topic area: *Pre-Transition Mathematics* and *Transition Mathematics*. *Pre-Transition Mathematics* teaches arithmetic, algebra, geometry, probability, and statistics. *Transition Mathematics* teaches more advanced arithmetic, algebra, and geometry, and connects these areas to measurement, probability, and statistics. The WWC identified 11 studies of these two *UCSMP* courses. Three of these studies meet WWC standards. The evidence presented in this report is from studies of the effects of *UCSMP* on students—including 3% Asian, 4% Black, 61% White, and 21% Hispanic students—in grades 6 to 9 in urban, suburban, and rural school districts.

What Happens When Students Participate in *UCSMP*?

The evidence indicates that implementing *UCSMP* has no discernible effects on general mathematics achievement or algebra outcomes compared with the other mathematics curricula used in study schools.

Findings on *UCSMP* from three studies that meet WWC standards are shown in Table 1. The table reports an effectiveness rating, an improvement index, and the number of studies and students that contributed to the findings. The effectiveness rating is based on the quality of the designs used in studies, whether the findings are favorable or unfavorable for the intervention, and the number of studies that tested the intervention. See Box 1 for more information on interpreting effectiveness ratings.

In order to help readers judge the practical importance of an intervention’s effect, the WWC translates findings

across studies into an “improvement index” by averaging findings that meet WWC standards within the same outcome domain. The improvement index can be interpreted as the expected change in percentile rank for an average comparison group student if that student had received the intervention. For example, an improvement index of +3 means that the expected percentile rank of the average comparison group student would increase by 3 points if the student received *UCSMP* instead of the curricula provided to the comparison group. A positive or negative improvement index does not necessarily mean the estimated effect is statistically significant.

The evidence presented in this report is based on available research. Findings and conclusions could change as new research becomes available.

Table 1. Summary of findings on *UCSMP* from studies that meet WWC standards

Outcome domain	Effectiveness rating	Study findings	Evidence meeting WWC standards (version 4.0)	
		Improvement index (percentile points)	Number of studies	Number of students
General mathematics achievement	No discernible effects	+3	3	637
Algebra	No discernible effects	-5	1	282

Note: The effects of *UCSMP* are not known for other outcomes within the Primary Mathematics topic area, including data analysis, statistics, and probability; geometry and measurement; and number and operations.

BOX 1. HOW THE WWC REVIEWS AND DESCRIBES EVIDENCE

The WWC evaluates evidence based on the quality and results of reviewed studies. The criteria the WWC uses for evaluating evidence are defined in the [Procedures and Standards Handbooks](#) and the [Review Protocols](#). The studies summarized in this report were reviewed under WWC Standards (version 4.0) and the Primary Mathematics topic area protocol (version 4.0).

To determine the effectiveness rating, the WWC considers what methods each study used, the direction of the effects, and the number of studies that tested the intervention. The higher the effectiveness rating, the more certain the WWC is about the reported results and about what will happen if the same intervention is implemented again. The following key explains the relationship between effectiveness ratings and the statements used in this report:

Effectiveness rating	Rating interpretation	Description of the evidence
Positive (or negative) effects	The intervention is <i>likely</i> to change an outcome	Strong evidence of a positive (or negative) effect, with no overriding contrary evidence
Potentially positive (or negative) effects	The intervention <i>may</i> change an outcome	Evidence of a positive (or negative) effect with no overriding contrary evidence
No discernible effects	The intervention <i>may result in little to no change</i> in an outcome	No affirmative evidence of effects
Mixed effects	The intervention <i>has inconsistent effects</i> on an outcome	Evidence includes studies in at least two of these categories: studies with positive effects, studies with negative effects, or more studies with indeterminate effects than with positive or negative effects

How is UCSMP Implemented?

The following section provides details of how districts and schools can implement *UCSMP*. This information can help educators identify the requirements for implementing *UCSMP* and determine whether implementing this intervention would be feasible in their districts or schools. Information on *UCSMP* presented in this section comes from the studies that meet WWC standards (Thompson & Senk, 2016; Thompson et al., 2005, 2012) and from correspondence with the developer.

- **Goal:** The *UCSMP* curriculum is designed to teach students mathematics concepts, applications, and skills.
- **Target population:** *UCSMP* is designed for students in grades 6 to 12.
- **Method of delivery:** *UCSMP* is a print and online curriculum that can be used to provide whole classroom, small group, and individual student instruction.
- **Frequency and duration of service:** The developer recommends *UCSMP* be used daily during math instruction for 45 to 60 minutes throughout the entire school year.

Comparison group: In the three studies that contribute to this intervention report, students in the comparison group used a variety of mathematics curricula including *Basic Mathematics* provided by Globe Fearon, *Middle School Math Course 2* and *Scott Foresman-Addison Wesley Math* provided by Scott Foresman-Addison Wesley, *Mathematics: Applications and Concepts Course 2* provided by Glencoe, *Passport to Algebra and Geometry and Mathematics: Concepts and Skills Course 2* provided by McDougal Littell, *Prentice Hall Mathematics: Course 1* provided by Prentice Hall, and *Everyday Mathematics* provided by McGraw-Hill Education.

- **Intervention components:** *UCSMP* includes a student and teacher edition of the curriculum, both of which are available in print and online. Each *UCSMP* course has 12 to 14 chapters, and each chapter includes 6 to 10 lessons. *UCSMP Transition Mathematics* is in the third edition and *UCSMP Pre-Transition Mathematics* is a first edition. Refer to Table 2 for additional details.

Table 2. Components of UCSMP

Key component	Description
Instructional approach	<i>UCSMP</i> lessons focus on introducing, developing, and reinforcing math concepts and skills while integrating arithmetic with statistics, geometry, and algebraic thinking. Each lesson has four parts: a warm-up activity, a math lesson in which the teacher instructs the whole class, a student assignment in which students work individually or in small groups, and a wrap-up activity. Homework is assigned daily. The lessons involve linking everyday situations and past experiences to new concepts; using multiple strategies to solve math problems; asking students to provide verbal and written explanations of their thinking; and using hands-on activities, games, and technology, including graphing calculators.
Curriculum materials	<i>UCSMP</i> includes a student textbook, available in print and online, that contains explanations, questions, and end-of-chapter summaries, self-tests, and reviews. The curriculum includes a teacher's edition, also available in print and online, that summarizes the math background for each lesson; provides an overview of each lesson, including questions to ask students; and provides guidance on how to differentiate instruction for students with different needs. Implementation guides are also available for teachers and school administrators to provide guidance and tips on the curriculum's instructional approach. The curriculum also includes the following teaching resources: additional practice and review problems, warm-up activities, and math games. Assessment resources include copies of all quizzes, chapter tests, and comprehensive exams.
Teacher training	The developer does not require teacher training and little or no training was provided to teachers in the studies reviewed in this report. However, <i>UCSMP</i> trainers can provide teacher trainings virtually or in person, depending on the needs and preferences of districts purchasing and implementing the curriculum. Available teacher training includes 1 to 2 days on the <i>UCSMP</i> philosophy, features, and recommended instructional approaches.

What Does UCSMP Cost?

The cost of *UCSMP* varies by course and number of students; each course can be purchased separately. This preliminary list of costs is not designed to be exhaustive; rather, it provides

educators an overview of the major resources needed to implement *UCSMP*. The program costs described in Table 3 are based on the information available as of June 2020.

Table 3. Cost ingredients for UCSMP

Cost ingredients	Description	Source of funding
Personnel	Certified teachers implement the curriculum in their daily classes. The developer does not publish training costs, and the cost of teacher training varies based on school district preferences and needs.	School districts or schools usually pay for teacher training costs.
Facilities	The intervention is typically implemented in students' regular classes. When the intervention is implemented using the online edition, schools need to provide computers in the regular classes or in a computer lab.	School districts or schools usually provide the classroom or computer lab facilities.
Equipment and materials	In a typical classroom, the materials include one physical or digital text and one scientific or graphing calculator for each student, one teacher's manual, and one set of teaching and assessment resources. With the purchase of at least 25 student editions, the publisher provides a teacher's edition, teaching resources, and assessment resources at no cost. The student edition costs \$69 to \$72 per student; therefore, the typical cost for a class of 25 students is \$1,800. The teacher materials can be purchased separately: the teacher's edition costs \$99 to \$129 per course, the teaching resources cost \$89 per class, and the assessment resources cost \$89 to \$99 per class.	School districts or schools usually purchase <i>UCSMP</i> materials, provide calculators to students, and make copies of student worksheets, if needed. Students or parents need to purchase calculators if the school does not provide them.

For More Information:

About UCSMP

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About the cost of the intervention

Web: <http://ucsmp.uchicago.edu/secondary/ordering/>

About the studies that meet WWC standards

Thompson, D. R., & Senk, S. L. (2016). *An evaluation of the University of Chicago School Mathematics Project: Pre-Transition Mathematics*. University of Chicago School Mathematics Project. https://s3.amazonaws.com/ucsmp/research_reports/ptm_evaluation_report.pdf

Thompson, D. R., Senk, S. L., Witonsky, D., Usiskin, Z., & Kealey, G. (2005). *An evaluation of the second edition of UCSMP Transition Mathematics*. University of Chicago School Mathematics Project. http://s3.amazonaws.com/ucsmp/research_reports/tm_second_edition_evaluation_report.pdf

Thompson, D. R., Senk, S. L., & Yu, Y. (2012). *An evaluation of the third edition of the University of Chicago School Mathematics Project Transition Mathematics*. The University of Chicago School Mathematics Project. http://ucsmp.uchicago.edu/resources/Transition_Mathematics_Third_Edition_Technical_Report.pdf

In What Context Was UCSMP Studied?

The following section provides information on the setting of the three studies of UCSMP that meet WWC standards, and a description of the participants in the research. This

information can help educators understand the context in which the studies of UCSMP were conducted and determine whether the program might be suitable for their setting.

WHERE THE STUDY WAS CONDUCTED



3 studies, 637 students in 14 elementary, middle, and high schools in more than 7 districts in northeastern, southeastern, midwestern, and western states

Urban, suburban, and rural districts

Race



Ethnicity



Gender: 51% Female 49% Male

Grades



LEARN MORE



Read more about the UCSMP intervention and the studies that are summarized in this brief in the [Intervention Report](#).