

Abstracts of Curricula Included in the Study

Investigations in Number, Data, and Space

Investigations in Number, Data, and Space[®] is a K-5 mathematics curriculum developed by TERC under a grant from the National Science Foundation. Its four major goals are:

- to offer students meaningful mathematical problems
- to emphasize depth in mathematical thinking rather than superficial exposure to a series of fragmented topics
- to communicate mathematics content and pedagogy to teachers
- to substantially expand the pool of mathematically literate students

The *Investigations* curriculum offers in-depth experiences in number, data, geometry, and the mathematics of change. The following aspects of the curriculum ensure that all students are included in significant mathematical learning by:

- Spending time exploring problems in depth
- Finding more than one solution to many problems
- Developing their own strategies and approaches, based on their knowledge and understanding of mathematical relationships
- Choosing from a variety of concrete materials and appropriate technology, including calculators, as a natural part of their everyday mathematical work
- Expressing their mathematical thinking through drawing, writing, and talking

Each grade level is organized into units that involve students in the exploration of major mathematical ideas, and may revolve around two or three related areas—for example, addition and subtraction or geometry and fractions.

The curriculum is presented through a series of teacher books. Each book provides lesson plans, materials lists, reproducible student sheets for activities and games, a family letter, homework suggestions, opportunities for skill and practice, assessment activities, notes to the teacher about the mathematics students are encountering, and examples of classroom dialogues. Some units include software to extend students' experience with the mathematics being explored. In addition to the curriculum units, Student Activity Books, Investigations at Home Booklets, and End of Unit Assessment Sourcebooks are also available for each unit in grades 1-5.

Math Expressions

Math Expressions is a complete K-5 curriculum based on the research results of the Children's Math Worlds (CMW) project. The CMW project was conducted by Dr. Karen C. Fuson, now professor emerita of learning sciences at Northwestern University, Evanston, Illinois, and funded over a ten-year period by the National Science Foundation. Both the program and the research combine a focus on conceptual understanding with opportunities to develop fluency with problem solving and computation. *Math Expressions* incorporates approaches from both reform and traditional mathematics programs while contributing new and effective teaching strategies to mathematics instruction. Key aspects of this curriculum include application of accessible algorithms that can be more easily understood and used by students; use of student math drawings and research-based visual representations to support student understanding and class discussion of mathematical thinking; an emphasis on in-depth sustained learning of core grade-level concepts (rather than a spiral curriculum) to support students' conceptual understanding and fluency; and a "learn by teaching" design to support teachers new to the curriculum. Embedded in the program are five core classroom structures—Building Concepts, Math Talk, Student Leaders, Quick Practice, and Helping Community—that support children from all backgrounds in developing mathematical understanding, competence, and confidence.

Saxon Math

For almost 20 years, *Saxon Math* has been providing elementary math curriculum that uses a multisensory approach designed to enable all children to develop a solid foundation in the language and basic concepts of mathematics. The program is intended to align with how young children learn and build fluency with math skills. This is accomplished through hands-on activities and mathematical conversations that actively engage students in the learning process. Concepts are developed, reviewed, and practiced over time supported by a philosophy that believes that understanding follows doing and discussing; mastery follows learning over time, and fluency follows practicing over time. *Saxon* is an imprint of Harcourt Achieve, Inc. Harcourt Achieve produces learning solutions and content that fundamentally and positively change the lives of young and adult learners. Published under the Rigby, Saxon, and Steck-Vaughn imprints, its products are based on a developmental philosophy that assesses learners' skills, matches them to appropriate content, and accelerates them to meet and exceed expectations. The Rigby imprint offers progressive learning solutions for core reading and English language learner instruction that provide differentiated instruction to match each student's instructional level. The *Saxon* imprint offers the nation's best selling and most thoroughly researched skills-based mathematics program for grades K-12, as well as popular phonics, K-3 spelling, and early learning programs. The Steck-Vaughn imprint offers easy-to-use, innovative learning solutions that accelerate content-area knowledge, reading skills, and preparation for standards-based tests, allowing learners to meet and exceed expectations. For more information, please visit www.HarcourtAchieve.com.

Scott Foresman-Addison Wesley Mathematics

Scott Foresman-Addison Wesley Mathematics promotes mathematical proficiency by focusing on the development of both mathematics skills and essential understandings. This is accomplished through:

- An articulation of essential outcomes and conceptual understandings for both the teacher and the student
- Questioning strategies that develop higher order-thinking skills embedded into the student and teacher materials
- Development of mathematical communication as a means of building a deep understanding of important mathematics

A hallmark of *Scott Foresman-Addison Wesley Mathematics* is explicit instruction of essential mathematics skills and concepts, using concrete manipulatives and pictorial and abstract representations. This approach helps to move all students forward in the development of mathematical proficiency. Ongoing assessment and diagnosis are coupled with strategic intervention to meet the individual needs of students, including frequent and timely student assessments integrated throughout the program to demonstrate student understanding and guide and monitor instruction. The authors of *Scott Foresman-Addison Wesley Mathematics* also recognize the importance of quality, ongoing professional development, and teacher support. Thus, professional development is provided daily within the teaching materials and is ongoing in multiple formats, including various uses of technology, to support the continued development of highly qualified teachers.