



# Scholastic Math Inventory™

*Scholastic Math Inventory* (SMI) is a research-based, computer-adaptive assessment that provides a direct measure of math achievement on The Quantile Framework® for Mathematics. Designed to assess learners in Grades 2-8, SMI provides educators with actionable data about their students' skills as a Quantile® measure, a score that describes the students' readiness for instruction. SMI also provides educators with skills-based instructional recommendations.

## **Assessment Design**

SMI uses the Quantile Framework for Mathematics, a developmental scale that provides measure on students' probable readiness to learn math skills and concepts up to pre-algebra. SMI generates criterion- and norm-referenced results for each student, including a percentile rank, stanine, normal curve equivalent (NCE), grade-level standard, performance standard, and native Lexile® measure. The test's level of difficulty automatically adjusts in response to students' answers, resulting in fast, accurate assessment with no "test burnout" for students. SMI uses the developmental Quantile scale ranging from Emerging Mathematics (EM) for scores below 0, to above 1250Q for pre-algebra math learners.

## **The Quantile Framework® for Mathematics**

SMI is based on The Quantile Framework® for Mathematics, launched in 2004 by MetaMetrics, an educational measurement and research organization. The Quantile Framework is a scientifically based system that links assessment to instruction, and matches students to instructional materials that are appropriate to their achievement level.

The Quantile Framework® for Mathematics is a scientific approach to math achievement. The Quantile measure is a math achievement or problem difficulty score followed by a "Q" (e.g., 850Q). The Framework provides a single unified frame of reference across the math strands by organizing skills and concepts into functional, hierarchical relationships. A *Qtaxon* refers to the individual skill or concept that comprises The Quantile Framework. Each skill or concept is assigned an "address" on the taxonomy, or *QTaxon* number. In addition, each *QTaxon* has an annotation that clearly describes how each math skill and/or concept falls along the continuum of math development, and features a Quantile measure which estimates its solvability in the taxonomy of the framework. Each *QTaxon* aligns with one of five content strands—Numbers and Operations, Geometry, Algebra/Patterns & Functions, Data Analysis & Probability, and Measurement, the process strands described by the national Council of Teachers of Mathematics (NCTM).

The Quantile Framework® for Mathematics uses the Quantile® measure to evaluate both math achievement and the level of math skills and concepts. By placing both student and instructional resources on the same scale, the Quantile Framework allows educators to understand the math skills students are ready to learn, match students with resources, differentiate instruction, target the correct intervention for math learners, and evaluate curriculum needs based on each student's level of performance.

## **The SMI Process**

Students log in to SMI with unique usernames that identify their grade and estimated performance level. Students complete the assessment with about 25-30 test items, or within 40 minutes. SMI's computer adaptive algorithm applies this information to select grade appropriate content according to the recommendations of NCTM and then adjusts the difficulty level of each item presented according to student responses throughout the assessment in order to pinpoint students' level of mathematical achievement. Over 5,000 items included in the test bank and advanced data collection technology ensure that students never receive the same test items twice, providing a highly individualized adaptive testing experience.

Quantile measures are featured in many widely adopted math basals, including *Everyday Math*, *EnVision Math*, *Houghton Mifflin Math*, *Math Trailblazers®*, *Prentice Hall Math*, *Connected Math*, *Hold McDougal Mathematics*, and *Math Connects*. Aligned to these basal math series through the Quantile Framework, SMI supports teachers as they match math lessons to their students' level of achievement. By utilizing a database, these resources are aligned by chapter and lesson to a Quantile measure. This database can be found at [www.quantiles.com](http://www.quantiles.com).

## **Progress Monitoring**

Using the *Scholastic Achievement Manager* (SAM), educators immediately have access to eight actionable reports. SMI generates reports for progress monitoring, instructional planning, school-to-home communication, and program management. Classroom and student-level reports allow teachers to monitor progress, plan for instruction, set goals, and communicate with parents or caregivers. Scalable administrator reports provide performance data and usage information across classrooms or buildings. The following SMI reports are available:

- The Performance Level Growth Report shows changes in distribution across Performance Levels over time by district, school, grade, and teacher.
- The Growth Report measures students Quantile growth between two SMI tests in a selected time period.
- The Intervention Grouping Report groups students into Performance Levels and targets for additional support those students in the Lower Performance Levels.
- The Student Test Printout provides a completed printout of the last SMI test the individual student has completed in a selected time period.
- The Student Progress Report shows a student's SMI test history and provides instructional recommendations based on the last test in a time period.
- The Test Activity Report provides data on how each school in a district is utilizing SMI.
- The Incomplete Test Report shows students who did not complete the SMI test on their latest attempt and the date of the incomplete test. It also includes the Quantile measure and date of the last completed test.
- The School-to-Home Report provides information for parents and caregivers about SMI and student test results, including Quantile measure and Performance Level.

## **Differentiated Instructional Strategies**

SMI is a fast, time- and cost-efficient tool for math educators. This assessment simplifies the data process by using technology to gather, organize, and analyze student performances. With SMI, educators receive real-time results to make informed, timely, and appropriate decisions for all students' instructional needs, including the needs of English Language Learners and student with disabilities. SMI includes four empirically determined performance standards. The four achievement levels are:

- Advanced—Students scoring in this range exhibit superior performance when instructed on grade-level appropriate skills and concepts and can be considered mathematically “above Grade Level.”
- Proficient—Students scoring in this range exhibit competent performance when instructed on grade-level appropriate skills and concepts and can be considered mathematically “on Grade Level.” Student performing at this level should be able to solve problems, reason, communicate, make connections, and use representations when using mathematical skills and concepts that are developmentally appropriate for the grade level.
- Basic—Students scoring in this range exhibit minimally competent performance when instructed on grade-level appropriate skills and concepts and can be considered mathematically “below Grade Level.”
- Below Basic—Students scoring in this range do not exhibit minimally competent performance when instructed on grade-level appropriate skills and concepts and can be considered mathematically significantly “below Grade Level.”

## **Home-School Connection**

SMI includes a School-to-Home report which provides information for parents about student progress and instructional recommendations. Teachers can send these reports home with students or use them during parent-teacher conferences.

## **Professional Development**

Scholastic offers a half- or full-day SMI Implementation Training for teachers and administrators. This optional training provides tips for administering the classroom-based SMI test and using the data to target instruction and monitor math progress. Participants will learn how to effectively use SMI, including:

- Understanding the Quantile Framework® for Mathematics and how to use Quantiles in the classroom
- Experiencing the SMI software and hands-on practice with the management system
- Analyzing report data to plan instruction and monitor progress

Scholastic also offers an SMI Interactive Webinar for teachers and administrators. This optional webinar training provides teachers, coaches, and administrators with the tools to successfully administer the SMI assessment to students. Participants will learn how to effectively use SMI, including:

- Understanding and using the Quantile Framework® for Mathematics
- Reviewing the SMI software and management system
- Using data-rich reports to screen for intervention, group for instruction, identify appropriate materials for differentiated instruction, and benchmark progress towards grade-level proficiency

 For additional information about the *Scholastic Math Inventory*, visit <http://www.tomsnyder.com/SMI/>.