

## Improving Student Achievement with the Quantile Framework

The Quantile® Framework for Mathematics takes the guesswork out of mathematics instruction. The Quantile Framework uses a common, developmental scale to measure student mathematics achievement, the difficulty of mathematical skills and concepts and the materials for teaching mathematics. By placing the mathematics skills or concepts, and students on the same scale, Quantile measures enable educators to predict which mathematical skills and concepts a student is ready to learn and those that will require additional instruction or enrichment. Students can then be matched with the resources that meet their learning needs. With Quantile measures, educators have a proven measure of student mathematics achievement to target instruction, monitor student progress, predict success in learning a new skill or concept, and forecast performance on high-stakes assessments.

# More Information, Not More Testing

Rather than requiring an additional assessment, Quantile measures add value to already existing tests and instructional programs. A growing number of classroom, norm-referenced and state-level assessments are linked with the Quantile Framework. Students who take these assessments receive a Quantile measure—a number followed by a "Q." A Quantile measure indicates that the student is ready for instruction of a particular mathematical skill or concept and has knowledge of the prerequisite skills necessary to learn it. Mathematics textbooks and other instructional resources also are linked with the Quantile Framework, allowing educators to match students with targeted materials to help them better understand mathematical skills and concepts.

# Learning on a Developmental Scale

The Quantile Framework has six content strands— Algebra and Algebraic Thinking; Number Sense; Numerical Operations; Measurement; Geometry; Data Analysis, Statistics, and Probability. The Quantile scale ranges from Emerging Mathematician (below0Q) to above 1600Q, and spans the mathematics continuum from concepts taught in kindergarten to those typically taught in Algebra II, Geometry, Trigonometry and Precalculus.

The Quantile scale is a taxonomy—or classification system—of mathematical skills and concepts along the continuum of mathematics development. Each content strand is annotated by "Quantile Skills and Concepts, or "QSCs," which describe specific skills, objectives or grade-level expectations that support each state's curriculum. Each QSC has a Quantile measure that estimates how difficult it will likely be for a student to learn, as compared with other skills in the taxonomy.

A Quantile measures students' mathematics achievement, not their grade level. A class of 30 sixth graders will likely have a wide range of Quantile student measures. Educators use those varied Quantile measures to target instruction and remediate as needed, using tools and resources that match the students' Quantile measures.

## Using Quantile Measures in the Classroom

Educators can use Quantile measures to support differentiated math instruction in these ways:

- Choose concepts lower than a student's Quantile range when factors make students view mathematics as more challenging, threatening or unfamiliar. Select concepts at or above a student's Quantile range to stimulate growth when a topic holds high interest for the student or when additional support such as background teaching or peer tutoring is provided.
- Enhance major themes of mathematics by building a bank of learning targets at varying levels that not only support the themes, but also provide a way for all students to participate in the theme successfully. For example, consider how addition progresses from single numbers to multi-digit numbers and then moves to decimals and fractions.



# The Quantile Framework for Mathematics

Quantile measures in the classroom and at home

# Using Quantile Measuresin the Classroom (Continued)

- Sequence mathematical learning targets according to their difficulty as much as possible.
- Develop a mathematics folder that goes home with students and returns weekly for review. The folder can contain examples of learning targets within a student's Quantile range, applications of topics outside the classroom, reports of recent assessments, and a parent form to record the amount of time spent on mathematics investigations at home.
- Develop lists of learning targets that are tailored to provide appropriately challenging and curriculum suitable for students.

# Using Quantile Measures at Home

Parents can use Quantile measures to support their child's progress in these ways:

- Ensure that a child gets plenty of mathematical experiences, concentrating on concepts within his or her Quantile range. Parents can ask the child's teacher to print a list of appropriate learning targets or search the Mathematical Skills Database at www.Quantiles.com.
- Communicate with the child's teachers about his or her mathematical needs and accomplishments. Teachers can use the Quantile scale to describe their assessment of the child's mathematical achievement.
- When a new topic proves too challenging for a child, use activities or other materials from the Math Skills Database at www.Quantiles.com to help. Review the prerequisite skills and concepts to ensure that gaps or misconceptions are not interfering with the current topic.
- Celebrate a child's mathematical accomplishments. The Quantile Framework provides an easy way for students to track their own growth. Parents and children can set goals for mathematics—spending so much time daily working on math investigations; discussing situational topics, such as statistics from a newspaper or discounts at the store; reading a trade book about a mathematical topic; or trying new kinds of websites and games. When children reach a goal, make it an occasion!

## The Science Behind the Quantile Framework

Launched in 2004, the Quantile Framework was created by the psychometric team at MetaMetrics®, an educational measurement and research organization. Based in part on the organization's more than 20 years of psychometric research, the release of Quantile measures came after four years of development, including an extensive national field study during the 2003–2004 school year.

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MetaMetrics, an educational measurement and research organization, develops scientific measures of student achievement that link assessment with targeted instruction to improve learning. The organization's psychometric team developed the widely used Lexile Framework for Reading; El Sistema Lexile para Leer, the Spanish-language version of the reading framework; The Quantile Framework for Mathematics; and The Lexile Framework for Writing. In addition to licensing Lexile and Quantile measures to state departments of education, testing and instructional companies, and publishers, MetaMetrics offers professional development, resource measurement and customized consulting services.

For more information on using Quantile measures in the classroom and at home, call 1–888–539–4537 or visit www.Quantiles.com.



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