

# The Quantile Framework<sup>®</sup> for Mathematics



Linking Assessment with Mathematics Instruction

## Improving Student Achievement

The Quantile Framework<sup>®</sup> 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 curriculum, teaching materials and students on the same scale, Quantile<sup>®</sup> measures enable educators to predict which mathematical skills and concepts a student is ready to learn and those that will require instruction. Then, students can be matched with the resources that meet their learning needs. With Quantile measures, educators have a proven metric of student mathematics achievement to target instruction, monitor student progress and forecast performance on high-stakes tests.

## 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 concept and has knowledge of the required skills necessary to learn it.

For example, if a state standard for third graders is to master adding and subtracting two- and three-digit numbers without regrouping, educators can use their students’ Quantile measures to forecast which students will have success with this skill and to identify those who may need to learn other skills or concepts before or during the lesson. Mathematics textbooks and other instructional resources are linked with the Quantile Framework, allowing educators to match students with targeted materials to help them better understand mathematical concepts or skills.

## Learning on a Developmental Scale

Developed to align with the National Council of Teachers of Mathematics “Principles and Standards for School Mathematics,” the Quantile Framework has five content strands—Numbers and Operations, Geometry, Measurement, Algebra/Patterns & Functions, and Data Analysis & Probability. The Quantile scale ranges from Emerging Mathematician (0Q and below) 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 “QTaxons,” which describe specific skills, objectives or grade-level expectations as defined by each state’s curriculum. Like a roadmap, QTaxons demonstrate how these skills fall along the continuum of mathematics development. Each QTaxon 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.

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

## Using Quantile Measures to Support Mathematics Instruction

The Quantile website ([www.Quantiles.com](http://www.Quantiles.com)) offers educators and parents a wealth of free resources for using Quantile measures to support and simplify differentiated mathematics instruction.



The QTaxon Search database enables users to search through the entire taxonomy of skills and concepts on the Quantile scale to obtain their difficulty levels, resources and specific state curriculum alignments. For example, if Texas teachers search for “decimals,” they are provided with the associated skills and concepts aligned with the state’s standards, the Texas Essential Knowledge and Skills (TEKS), and the difficulty level for each skill or concept. Resources, such as mathematics textbooks, Web links, worksheets, math-literature guides, black line masters and games, also can be found through the search features directly linked to state mathematics standards by grade level. The QTaxon Search allows educators to match students with the instructional materials that best meet their mathematics learning needs, which simplifies the instructional planning process.

Educators also can use the Quantile Teacher Assistant to see how the Quantile range of the class compares with the Quantile measure of the skill or concept being taught. Then, educators can access a variety of resources, including worksheets, vocabulary terms and websites, that are aligned with their state standards to support differentiated instruction based on each student’s mathematical ability.

In addition, the Quantile website provides a database of more than 1,000 mathematical terms and concepts connected to the utilities on the site. The Quantile map, a graphic representation of the Quantile Framework, also is available. The map is the only tool available that visually illustrates mathematics development and the connections between skills and concepts across the content strands.

### The Science Behind the Quantile Framework

Launched in 2004, the Quantile Framework was created by the renowned psychometric team at MetaMetrics®, an educational measurement and research organization that also developed The Lexile Framework® for Reading and The Lexile Framework for Writing. 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. Today, MetaMetrics continues to develop scientific measures of student achievement that link assessment with targeted instruction to improve learning.



**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 how The Quantile Framework for Mathematics can help to link assessment with instruction and improve student mathematics achievement, call **1-888-539-4537** or visit **[www.Quantiles.com](http://www.Quantiles.com)**.



**MetaMetrics**  
LINKING ASSESSMENT WITH INSTRUCTION

1000 Park Forty Plaza Drive, Suite 120  
Durham, North Carolina 27713  
919-547-3400/1-888-539-4537  
**[www.Quantiles.com](http://www.Quantiles.com)**