



Quantile: More than a number

THE QUANTILE FRAMEWORK[®] FOR MATHEMATICS

The Quantile Framework for Mathematics is a scientific approach to measurement that locates a student's ability to think "mathematically" in a taxonomy of math skills, concepts and applications. The Quantile Framework measures student mathematical achievement and concept/application solvability on the same scale, enabling educators to use Quantile[®] measures to monitor a student's development in math and forecast performance on end-of-year tests.

Quantiles take the guesswork out of determining which mathematics skills a developing mathematician has mastered and which ones require further instruction. Because The Quantile Framework uses a common, developmental scale to measure both student mathematical achievement and task difficulty, educators can accurately determine a student's readiness to learn more advanced mathematics skills and solve more complex problems with targeted instruction.

What is a Quantile?

The Quantile Framework for Mathematics is the only scientifically-valid instrument that uses a single scale and a standard measure to determine mathematical achievement. The framework provides educators with unmatched flexibility and the confidence to differentiate instruction based on a student's Quantile measure — regardless of which Quantile-leveled assessment was used to generate the measure.

Quantiles measure student mathematical achievement and concept/application solvability similar to the way Lexiles[®] measure reading ability and text difficulty, with a simple number followed by the letter "Q" (as Lexiles are followed by an "L"). The Quantile Framework spans the developmental continuum from kindergarten mathematics through the content typically taught in Algebra II, Geometry, Trigonometry and Pre-calculus — from Emerging Mathematician (0Q and below) to above 1400Q.

What is a QTaxon?

A QTaxon defines a specific mathematical topic, concept or skill and is used to annotate The Quantile Framework. Each QTaxon has a Quantile measure which estimates its solvability in the taxonomy of the framework. QTaxons are linked to supporting and precursory QTaxons which illustrate the interconnectivity of The Quantile Framework and the natural progression of mathematical skills needed to solve increasingly complex problems.

Each QTaxon aligns with one of the five Quantile content strands: Numbers and Operations, Geometry, Measurement, Algebra/Patterns & Functions, and Data Analysis & Probability. The Quantile strands integrate and align with the process strands described by the National Council of Teachers of Mathematics (NCTM), including Representation, Reasoning and Proof, Communication, Connections, and Problem Solving, as well as the curriculum standards of state departments of education. NCTM is the world's largest mathematics education organization founded to ensure the highest quality of mathematics instruction for all students.

The Quantile Framework comprises more than 500 QTaxons which educators can use to monitor progress and target instruction by comparing a student's Quantile measure to the measure of a particular QTaxon. The QTaxons also provide educators with a unique opportunity to link their state's curriculum standards to The Quantile Framework, ensuring students are prepared with the mathematical skills required to pass end-of-year assessments and to succeed in post-secondary education and the workplace.

The Quantile Map

The Quantile map is a graphic representation of The Quantile Framework, depicting sample QTaxons arranged by strand and Quantile measure. The map is the only tool available that illustrates mathematics development and the connections between QTaxons across the content strands. Educators can use the map to target instruction and forecast student progress based on which mathematical skills the student should have mastered on a strand-by-strand basis and at each Quantile measure.

Quantiles in the Classroom

Quantile measures will be available from many popular norm-referenced and criterion-referenced assessments. Quantiles are currently available from Pearson PAseries™ Mathematics and other state-specific tests.

Students who take a mathematics achievement test that is linked to The Quantile Framework will receive a Quantile measure. Educators can use these Quantile measures to match students to level-appropriate instructional materials and forecast understanding. For example, a student with a Quantile measure of 500Q would be ready for instruction of mathematics problems at a demand level of 500Q.

Quantiles enable educators to:

- Determine student readiness for new mathematical skills and concepts (i.e., ready for 30 minutes of introductory instruction).
- Link mathematical skills and concepts/applications across the Quantile strands to see the “big picture” in developing a mathematics curriculum.
- Determine which mathematical skills and concepts a student can master, based on his/her Quantile measure and the QTaxon measure.
- Identify a student’s strengths and weaknesses in mathematics and appropriately determine targeted instruction for him/her.
- Monitor student development and forecast understanding of more advanced mathematics skills, concepts and applications.

By connecting students’ Quantile measures to Quantile-leveled resources, The Quantile Framework provides educators with actionable information from mathematics assessments and diagnostic tools that they can use to target instruction, forecast understanding and improve mathematics achievement.



Quantile: More than a number

For more information on The Quantile Framework for Mathematics, call **1.888.539.4537** or visit **www.Quantiles.com**.

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Progress Assessment Series™ (PAseries) Mathematics from Pearson Education is the first formative assessment to use Quantiles to measure progress and forecast student growth toward state performance goals or grade-level expectations. PAseries connects classroom instruction to assessment results, helping states and districts meet increasing demands for accountability. For more information, visit www.PearsonPAseries.com.

The Quantile Framework for Mathematics is supported by the following utilities and services:

QTaxon Database: Search QTaxons by Quantile measure, keywords, mathematics strand and state curricular standards.

Quantile Mathematics Dictionary: Search online dictionary of mathematical terms and concepts.

Quantile Map: View, on a strand-by-strand basis, which math skills and tasks a student should have mastered at each Quantile measure.

Quantile Professional Development: Learn how to implement Quantiles in the classroom with a facilitator-led or online workshop.

About MetaMetrics, Inc.

MetaMetrics is a privately-held educational measurement firm based in Durham, NC. The company was founded in 1984 with the goal of bringing meaning to measurement. MetaMetrics helps educators improve students’ success in reading comprehension and math achievement by evaluating both student ability and subject materials on the same scale. The company licenses test methods and measures, delivers professional development instruction and offers customized consulting services.

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