



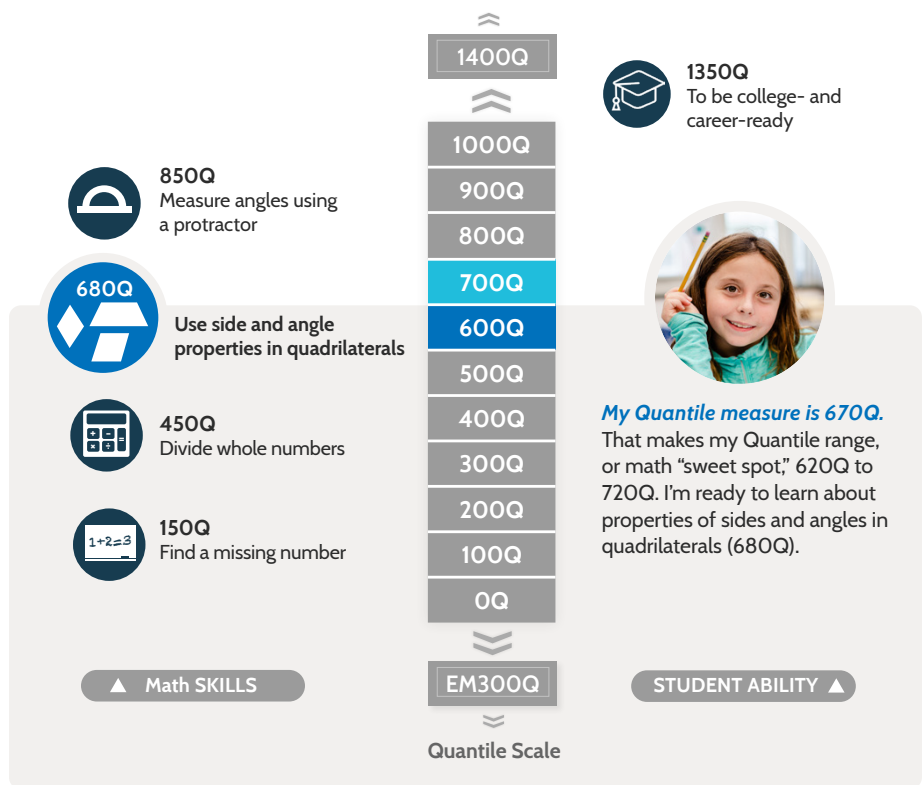
QUANTILE® FRAMEWORK FOR MATHEMATICS

How Mathematics Content Standards and Materials Are Aligned and Calibrated to the Quantile Framework

Quantile® measures can help connect students of all ages with materials and resources at the right challenge level. This connection is possible because both the difficulty of math materials and a student’s readiness to learn new math skills and concepts are measured on the same scale. Quantile measures range from below zero (what we call Emerging Mathematician or EM) to above 1600Q and span the math skills and concepts taught in kindergarten through high school. Each of the scale’s 550+ Quantile Skills and Concepts (QSCs) has a Quantile measure that describes its difficulty.

How the Quantile Scale Was Developed

The Quantile Framework was established beginning with a review of curricula from the National Council of Teachers of Mathematics Standards, the National Assessment of Educational Progress and numerous states. Over 550 Quantile Skills and Concepts (QSC) were identified in this review. Each QSC was aligned with one of the six math content strands (number sense, numerical operations, geometry, algebra and algebraic thinking, data analysis, statistics and probability, and measurement) and assigned a grade level at which the content typically first appears. Almost all of the QSCs were assigned prerequisite skills that are usually learned first and impending skills that come later.



Assessment items were developed and tested in field studies with thousands of students in 2004. Next, field-tested items were calibrated to the Quantile scale. Finally, the Quantile Framework’s validity was confirmed by examining how well Quantile measures related to other measures (tests) of math understanding through field and linking studies. Periodically, the QSCs are reviewed and new QSCs are developed and added to the Quantile Framework.

Connect to Tools & Resources on the Lexile® & Quantile® Hub

The Lexile and Quantile Hub (Hub.Lexile.com) provides easy access to math (and reading) tools and resources that accelerate learning, including:



QUANTILE MATH SKILLS DATABASE

Search by your state standards for resources matched to students’ Quantile measures.



QUANTILE GROWTH PLANNER

Forecast student growth and explore the math demands of careers.



Resource Center

Search by “Math Resources” and grade level using the dropdown menus.

Frequently Asked Questions

The answers on this page address questions about how Quantile Skills and Concepts (QSCs) and their accompanying measures can be:

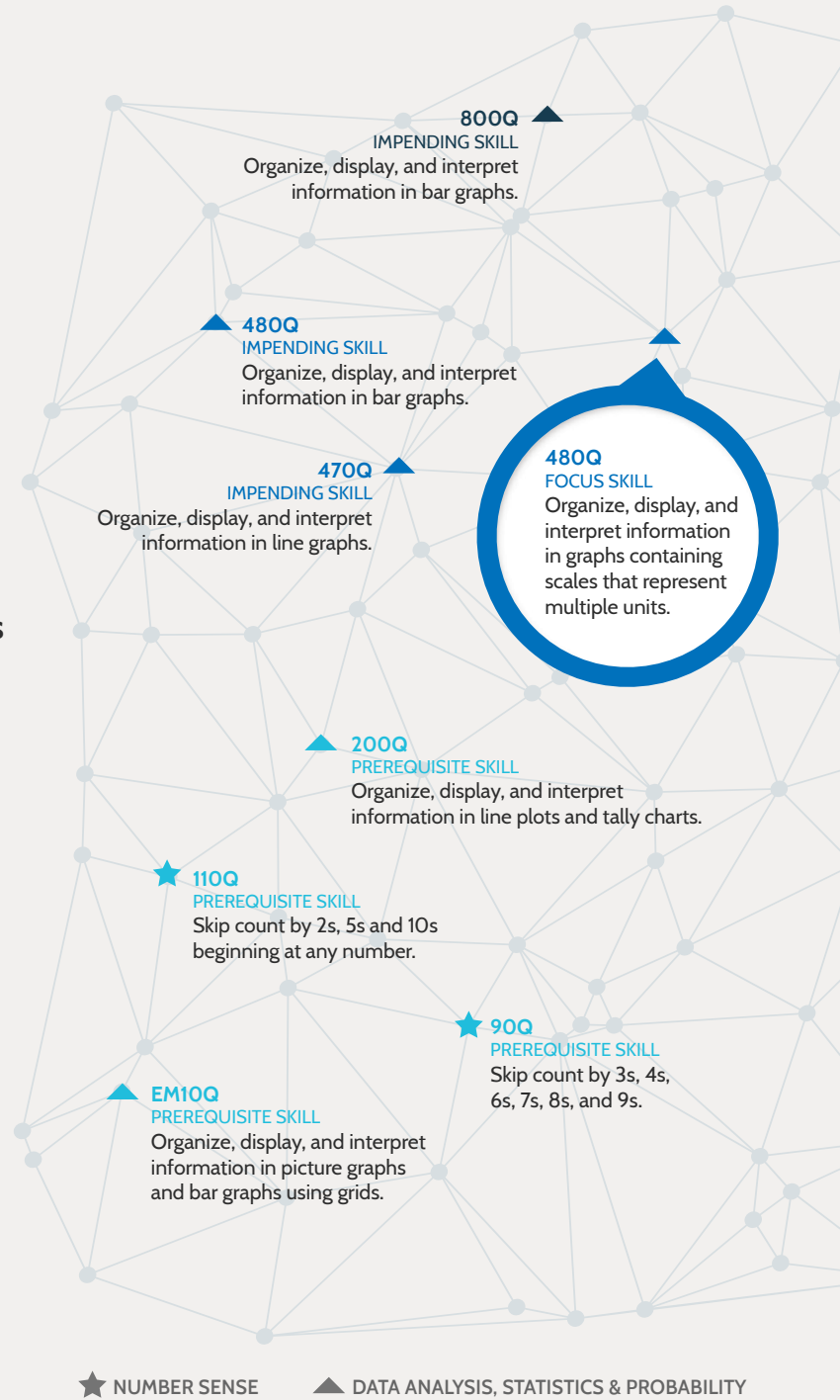
- Aligned with state mathematics content standards.
- Used to calibrate mathematics materials (lessons, games, online modules) to the Quantile Framework.

How do state mathematics content standards get aligned with the Quantile Framework?

State content standards describe specific math skills and concepts that students are expected to know and be able to do. MetaMetrics® subject matter experts align state content standards with a QSC (or QSCs) by examining the similarity of the skills and concepts and the consistency of the depth of knowledge.

How are mathematics materials calibrated to the Quantile Framework?

The math demand of the material, such as textbook lessons, games and other resources, is analyzed by MetaMetrics subject matter experts and the Quantile Analyzer (a software application) to determine which QSCs are represented. Oftentimes, there are several QSCs assigned with a specific lesson or game. The Quantile Analyzer and subject matter reviews are done independently. Results are compared and a Quantile measure is assigned that describes the overall difficulty of the QSCs represented.



View more QSCs, as illustrated above, in the Quantile map: www2.metametricsinc.com/hubfs/Quantile-Map-for-Mathematics_11x17.pdf

How are mathematics materials selected and calibrated for use in the Lexile and Quantile Hub?

Textbook lessons and/or activities submitted by math content publishers are calibrated by MetaMetrics (under contract to the publisher) and the information is used in the Hub's math tools and resources. In addition to calibrating contracted materials, MetaMetrics identifies web and general use resources using the following criteria:

- Curricular alignment to QSCs (but, not specific state content standards)
- Instructional support (conceptual understanding) for materials to be used with **Quantile® Math Skills Database**
- Type of activity — computational fluency activity and enrichment activity for materials
- Strength or origin of resource (organization), especially for math materials shared in the Hub's Resource Center