



# MI Math Inventory® PROFESSIONAL LEARNING GUIDE

Grades K–Algebra II

- Program Overview
- The Student Experience
- Understanding the Quantile Framework
- Results and Data Analytics
- Using the Digital Management Tools
- Best Practices
- Connecting Assessment to Instruction



The logo features a large, bold letter 'M' where the handle of the letter forms a magnifying glass. To the right of the 'M' is the word 'Math' in a large, bold, sans-serif font, and 'Inventory' in a smaller, bold, sans-serif font. A registered trademark symbol (®) is located at the top right of 'Inventory'.  
**PROFESSIONAL  
LEARNING GUIDE**

**Grades K–Algebra II**

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# Welcome to *Math Inventory*

*Math Inventory* helps teachers effectively differentiate instruction and accelerate student growth from Kindergarten through Algebra II and empowers teachers to help students meet higher standards in preparation for college and career.

## A New Way to Measure

Are your students making measurable progress toward college and career readiness?

Will they have the needed prerequisite skills for Algebra II?

Are they receiving the appropriate math intervention?

*Math Inventory* is specifically designed to help you answer these questions for your students in Kindergarten through Algebra II. This powerful universal screener and adaptive assessment shifts the paradigm from focusing on what students *do not* know to identifying what students are ready to learn.

*Math Inventory* assesses understanding across five strands of mathematics and is aligned to the Common Core State Standards and similar standards for college and career readiness. The results of this assessment place students on a quantifiable trajectory for college and career readiness and enable you to better match students to appropriately leveled topics and skills, encouraging growth and success.

## Built on a Proven Framework

*Math Inventory* was developed in partnership with MetaMetrics, Inc., the developers of the Quantile® Framework for Mathematics—a proven measure for math achievement and math concept difficulty. 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 students and instructional resources on the same scale, the Quantile Framework allows you to match students with appropriate resources, differentiate instruction, and evaluate curriculum needs based on each student's level of performance.

Using the Quantile measures reported by *Math Inventory*, you can:

- **Conduct universal screening**—identify students' proficiency with mathematical concepts and skills prior to placement
- **Set a quantifiable trajectory to college and career**—benchmark student progress toward district goals as well as college and career readiness
- **Make instructional decisions**—plan instruction for groups of students and provide the most appropriate instruction for each student
- **Monitor progress**—measure students' growth and gauge the effectiveness of instruction and curriculum

This Professional Learning Guide will provide you with all the information necessary to effectively use *Math Inventory* and the Quantile Framework to help your students become confident and successful in mathematics.

Professional Learning Guide

# Program Overview

## Program Materials

*Math Inventory* is a computer-adaptive, research-based assessment that measures students' readiness for instruction and tracks progress from Kindergarten through Algebra II and college and career readiness.



**TIP**  
The lowest possible score is also called LOSS (Lowest Obtainable Scale Score). The highest possible score is also called HOSS (Highest Obtainable Scale Score). These caps produce more accurate results for 99 percent of students. One percent will score outside the caps.

### The Student Assessment

*Math Inventory* is a 20- to 35-minute adaptive assessment that students take independently on a computer. The test includes an item bank of more than 6,000 items from across five strands of mathematics aligned to state and other standards at each grade level and adapts to each student's performance, adjusting the level of difficulty in the questions until the student completes 30 questions. The offered item pool is calibrated by the student's grade level, so that fifth-grade items on a fifth-grade test are calibrated to fifth-grade responses, while those same items presented to fourth graders are calibrated to fourth-grade responses. The final *Math Inventory* score is reported as a Quantile measure—from below 0Q (Emerging Mathematician scale) to above 1600Q—that represents the student's readiness to succeed with math instruction from Kindergarten through Algebra II. Scores are capped at the very low end and the very high end of each grade level. When students score at these caps over several tests, it is a signal to teachers to use additional data points to establish the individual student's readiness to learn.

The screenshot shows the initial welcome screen of the Math Inventory software. At the top, there is a navigation bar with the logo 'MC', the name 'MCcooper | Logout', and language options for English, Español, Help, and Next. Below the navigation bar, a large text box contains the following text:

Welcome to The Math Inventory.

First, the test will measure how fast you can answer math facts.

Start with typing practice. Type the number as fast as you can. Then, choose Enter or the Next button.

### SAM Central

Results of the student assessment are organized and reported in SAM Central, where you will also find links to professional learning support and instructional planning tools. SAM Central empowers educators with the latest in smart-data technology. From one powerful platform, the data analytics and professional learning tools maximize effectiveness in the classroom. Interactive reporting offers the ability to monitor student performance in real time, provide differentiation, and track progress toward mastery with grade-level standards as well as college and career readiness.

## Reports

Welcome, John Teacher | Wednesday Jun 12, 2019 | Gateway | Log Out

**SAM Central** Powered by SAM

**Test Status**  
Last Administration 06/10/2019  
COMPLETED 26 More Info

**Current Performance Level**

| Performance Level | Count |
|-------------------|-------|
| ADVANCED          | 4     |
| PROFICIENT        | 12    |
| BASIC             | 6     |
| BELOW BASIC       | 4     |

**Quantile Growth**

| Quantile Range | Number of Students |
|----------------|--------------------|
| 5 - 10         | 10                 |
| 10 - 20        | 7                  |
| 20 - 50        | 9                  |
| > 50           | 400                |

Average Growth for Class: 850 More Info

**News Feed**

- 16 students are on track for College and Career Readiness. More Info
- 06/10/2019 Test Duration: 4 students <15 minutes More Info
- 06/10/2019 Test Duration: 4 students <15 minutes More Info

**Professional Learning**

Explore the Math Skills Database Downloadables Add Class +

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### SEE ALSO

Four other guides are also available:

- *Math Inventory Software Manual*
- *Using SAM Central with Math Inventory*
- *Math Inventory Technical Guide*
- *Math Inventory Installation Guide*

These guides as well as other useful information and resources are available for download on the *Math Inventory* Product Support site at: [hmhco.com/mi/  
productsupport](http://hmhco.com/mi/productsupport)

In SAM Central results are reported in both criterion-referenced and norm-referenced terms, indicating a student's mathematical performance on the Quantile scale as well as how his or her test results compare to those of other students. Teachers can quickly view data analytics for a class or print PDF reports at class, student, and teacher levels to monitor growth, plan instruction, and manage test administration.

## Professional Learning

SAM Central provides professional learning resources, including a link to the MetaMetrics Math Skills Database, where teachers can view information on Quantile alignment to the Common Core State Standards and individual state standards, as well as alignments to widely adopted basal textbooks and math interventions, for placement, instructional planning, curriculum pacing, and forecasting needs.

# Getting to Know *Math Inventory*

## Developing *Math Inventory*

The development of *Math Inventory* was informed through leadership by organizations that include the National Math Panel, the National Council of Teachers of Mathematics, and the Common Core State Standards Initiative.

- **The National Math Panel** presented *Foundations for Success: The Final Report of the National Mathematics Advisory Panel* to the president of the United States and the secretary of education in 2008, outlining key findings in education research and recommendations for improved instruction.
- **The National Council of Teachers of Mathematics** is the public voice of mathematics education, supporting teachers to ensure equitable mathematics learning of the highest quality for all students through vision, leadership, professional development, and research ([www.nctm.org](http://www.nctm.org)).
- **The Common Core State Standards Initiative** is a set of high-quality academic standards in mathematics and English language arts/literacy (ELA). These learning goals outline what a student should know and be able to do at the end of each grade ([www.corestandards.org](http://www.corestandards.org)).

## Understanding *Math Inventory*

*Math Inventory* shifts the paradigm from pinpointing what students *do not* know to defining what students are ready to learn. This shift is instrumental in helping students achieve success with math instruction in the classroom. With data-rich reports, *Math Inventory* helps teachers differentiate math instruction and accelerate growth.

### *Math Inventory*

- Screens for math placement and intervention
- Benchmarks math progress at key intervals, three to five times a year
- Links students' readiness for instruction to mathematics concepts and skills
- Aligns to individual state standards and the Common Core State Standards
- Provides a quantifiable trajectory to algebra readiness
- Supports a Response to Intervention implementation with immediate actionable data
- Informs resource planning and district decision-making

## Taking the *Math Inventory* Assessment

Students use a computer to take three to five *Math Inventory* assessments during the school year. Each student receives an individualized assessment based on his or her performance. *Math Inventory* assessment experience consists of the following five steps:

1. Launch *Math Inventory* and log on to the program.
2. Complete the Early Numeracy Screener (Grades K and 1) or Fact Screener (Grade 2 through high school) on the first test each school year and until the student passes.
3. Listen and read along to the instructions, and then complete the Practice Test.
4. Complete the 25–30 questions of the *Math Inventory* assessment. (If a student is still working after 60 minutes and has completed 25 or more questions, the test is considered complete.)
5. View the Quantile measure at the completion of the assessment.

The screenshot shows the Math Inventory Class Analytics interface. On the left, there's a sidebar with 'DATA SNAPSHTOS' showing 'Test Status' (Completed: 6, Incomplete: 5, Not Started: 6), 'Class Analytics' (Current Quantile), 'Quantile Growth', 'Student Analytics', and 'Run a Report'. Below that are sections for 'PROFESSIONAL LEARNING' (Explore the Math Skills Database, Downloadables) and 'MANAGE CLASS' (Class Profile). The main area is titled 'Class Analytics' and shows 'Current Quantile' with a pie chart divided into four segments labeled 1, 2, 3, and 4. A callout box states '50% of your students have a Quantile score between EM and 75Q'. Below the chart is a table with columns: SCREENER (Student Name, Grade, Addition+, Multiplication+), PERFORMANCE & USAGE (Quantile+, Performance Level+, Date+, Duration (min)+, % Rank, NCE+, Stanine+), and NORMATIVE DATA. The table lists seven students: Poincaré, Euler, Turing, Newton, Lagrange, Hilbert, and Gauss, all in Grade 7.

| SCREENER               |   |   |   | Quantile+ | Performance Level+ | Date+      | Duration (min)+ | % Rank | NCE+ | Stanine+ |
|------------------------|---|---|---|-----------|--------------------|------------|-----------------|--------|------|----------|
| Poincaré, Henri        | 7 | ● | ● | 393Q      | BELOW BASIC        | 03/26/2018 | 1.72            | 1      | 1    | 1        |
| Euler, Leonhard        | 7 | ● | ● | 525Q      | BELOW BASIC        | 03/26/2018 | 3.6             | 2      | 7    | 1        |
| Turing, Alan           | 7 | ● | ● | 572Q      | BELOW BASIC        | 03/26/2018 | 3.06            | 3      | 10   | 1        |
| Newton, Isaac          | 7 | ● | ● | 721Q      | BELOW BASIC        | 03/26/2018 | 2.61            | 18     | 31   | 3        |
| Lagrange, Joseph-Louis | 7 | ● | ● | 834Q      | BASIC              | 03/26/2018 | 4.5             | 39     | 44   | 4        |
| Hilbert, David         | 7 | ● | ● | 895Q      | PROFICIENT         | 03/26/2018 | 3.74            | 54     | 52   | 5        |
| Gauss, Carl            | 7 | ● | ● | 915Q      | PROFICIENT         | 03/26/2018 | 10.16           | 60     | 55   | 6        |

## Using *Math Inventory* Data

Assessment results are immediately available through data-rich reporting features in SAM Central. Use *Math Inventory* data to:

- Track students' growth toward Algebra II and college and career readiness
- Determine students' readiness for grade-level math instruction
- Inform and differentiate instruction to meet the needs of all learners
- Identify students for intervention and targeted support

## Previewing the Quantile® Framework

*Math Inventory* results are based on the Quantile Framework for Mathematics, which uses Quantile measures to evaluate students' readiness for math instruction and the difficulty level of math skills and concepts.

### SEE ALSO

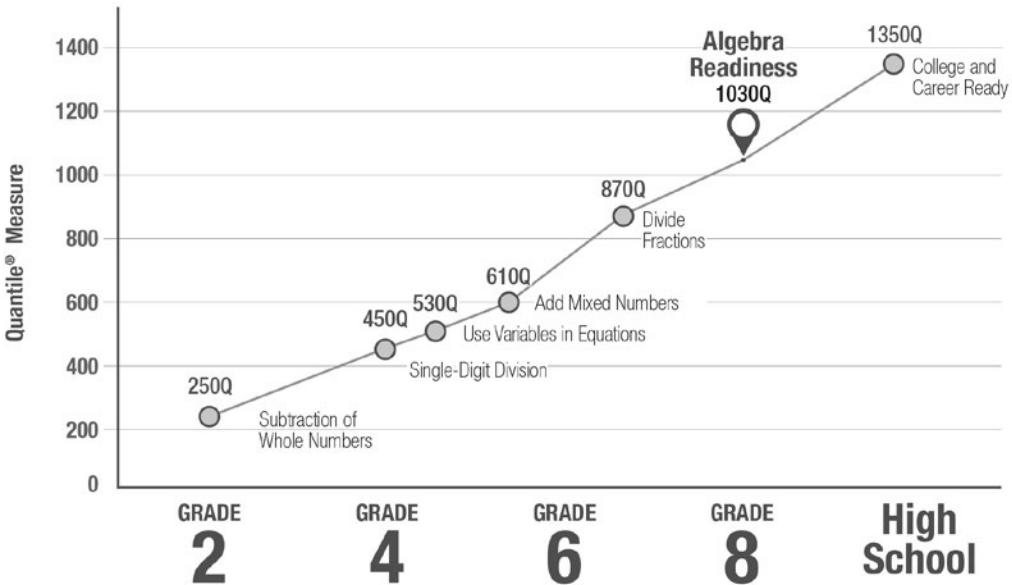
See [page 40](#) for more information on the Quantile Framework for Mathematics.

### A Comprehensive Taxonomy of Math Skills

The Quantile Framework for Mathematics was developed by a team of experts at MetaMetrics, an educational measurement and research organization. The Quantile Framework consists of more than 500 critical skills and concepts—aligned to the Common Core State Standards and individual state standards—that accelerate student learning toward college and career readiness. The taxonomy dimensionally represents the continuum of skills and concepts inherent in mathematical development. This framework provides educators with a single unified frame of reference across mathematics by organizing skills and concepts into functional, hierarchical relationships.

### Understanding the Framework

By placing both students and math concepts and skills on the same scale, the Quantile Framework offers valuable insight into a student's readiness to learn more advanced mathematical skills and concepts—and how well that student is likely to solve more complex problems with targeted instruction. Knowing both the difficulty level of topics and students' likelihood of achieving success with the targeted topic enables teachers to differentiate and target instruction to meet the needs of all learners. In addition to placing math topics and students on the same scale, the Quantile Framework provides a quantifiable trajectory to Algebra II and college and career readiness.



## Defining Key Terms

To fully grasp the breadth of the Quantile Framework, it is important to know and understand key terms.

### Quantile Skill and Concept (QSC)

The Quantile Framework is composed of more than 500 mathematical skills and concepts, called Quantile Skills and Concepts, or QSCs, which educators can use to monitor progress and target instruction. Each skill or concept is assigned an “address” in the taxonomy, or an ID number. In addition, each QSC has a difficulty level that clearly describes where each math skill and/or concept falls along the continuum of math development. This difficulty level is referred to as a Quantile measure (QMeasure).

### QMeasure

Each of the QSCs has a corresponding Quantile measure that estimates how demanding (or how difficult, in terms of specific tasks) the concept will likely be for students to learn as compared to other QSCs in the taxonomy. Quantile measures range from below 0Q (Emerging Mathematician scale) to above 1600Q, with 1350Q generally indicating college and career readiness. A Quantile measure (expressed as a number followed by the letter “Q”) also estimates how well a student will understand the concept or skill before instruction.

### Knowledge Cluster

Quantile skills and concepts that are related to one another form Knowledge Clusters. Each Knowledge Cluster consists of different types of QSCs that support and further learning of the target skill or concept. A Knowledge Cluster demonstrates the interconnectivity across different math topics in the Quantile Framework and the natural progression of mathematical skills needed to solve increasingly complex problems.

## Using the Quantile Framework

*Math Inventory* utilizes the Quantile Framework to help teachers make instructional decisions about grouping, placement, and course pacing and provides tools to effectively differentiate instruction.

*Math Inventory* reports provide recommendations for QSCs that students should focus on based on their Quantile measures. Using the Knowledge Clusters and tools of the Quantile Framework, teachers can identify appropriate QSCs and instructional resources at students’ Quantile measures to help scaffold and differentiate instruction of core grade-level material.

### ► REFLECTION

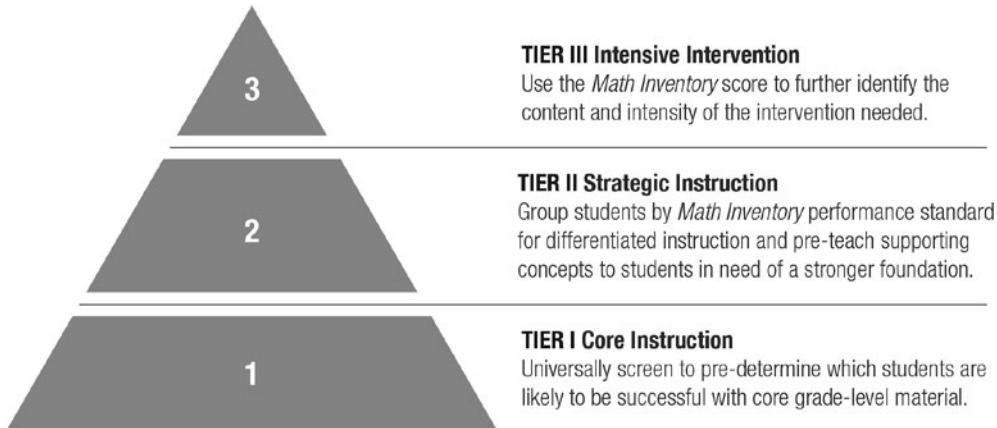
One feature of the Quantile Framework I’d like to investigate further is . . .

## Aligning with Response to Intervention

*Math Inventory* aligns to Response to Intervention, a tiered model of instruction and intervention to address all students' academic needs.

### What Is Response to Intervention?

Response to Intervention (RTI) is a model used in schools across the nation to provide high-quality instruction and intervention that matches students' academic needs. The model features a multilevel prevention system with three tiers of increasingly intensive educational support.



### Role of Assessments

An essential component of RTI is initial and ongoing assessment to use in placing students and evaluating the effectiveness of instructional strategies.

#### Universal Screening

The RTI model recommends using universal screening to place all students at the appropriate tier of instruction. *Math Inventory* serves as a universal screener to inform student placement decisions.

#### Ongoing Growth Monitoring

The RTI model emphasizes the importance of ongoing data collection to monitor student growth and determine whether interventions are working. Teachers can administer *Math Inventory* to students three to five times per year to monitor overall math growth for Tier 1 and Tier 2.

#### Data-Based Decision Making

Central to the RTI model is the use of student data to inform decisions regarding instruction and movement within the multilevel prevention system. Teachers can access immediate and actionable *Math Inventory* data and instructional recommendations through SAM Central.

# Understanding How *Math Inventory* Works

*Math Inventory* adapts to student performance, ensuring that results provide a true indication of math understanding. Assessment results provide actionable data with built-in accountability measures for ongoing growth monitoring.

## Adaptive

*Math Inventory* adaptive assessment is an effective tool to assess students' math readiness for the following reasons:

- The assessment adapts to students' responses. Once a student starts the assessment, questions get easier or harder according to performance, and when the student has answered 30 questions, the assessment stops. However, if a student is still working after 60 minutes and has completed 25+ questions, the assessment will stop and be considered complete.
- Computer-adaptive testing shortens test-taking time and increases testing accuracy.
- Younger and lower-achieving students will experience less test-taking anxiety and less fatigue because questions are more closely matched to their ability.
- The assessment provides students with a different set of items each time, so no two assessments are identical on the item level.

## Actionable

*Math Inventory* is actionable for teachers and administrators because assessment results:

- Measure a student's level of math understanding, enabling teachers to plan instruction accordingly
- Track students' growth toward college and career readiness
- Identify appropriate math content for which students are ready to receive instruction
- Help teachers tailor instruction to meet the needs of all learners

## Accountable

*Math Inventory* ensures accountability for ongoing growth monitoring in the following ways:

- The assessments provide an accurate measure of students' math levels over time.
- Students' results are automatically saved in the management system in nine reports generated at the school and district levels and for individual students, groups, or classes.
- An Incomplete Test Report identifies students who do not complete a test, making teachers aware of situations that may require follow-up action.
- Results are criterion- and norm-referenced, providing a snapshot of students' mathematical achievement on a scale of mathematical difficulty, as well as how their assessment results compare with those of other students.

## Understanding Why *Math Inventory* Works

*Math Inventory* was designed to provide fast and easy test administration that produces reliable results to inform instruction.

### Fast and Accessible

- *Math Inventory* provides fast and accessible testing on a variety of platforms to meet school- and district-wide needs for universal screening and growth monitoring.
- *Math Inventory* can be accessed in either a server-based or a web-based platform.
- The mobile edition is built in HTML 5 and available for iPad and Android tablet devices, iOS 7 and above, iPad 2 and above, Samsung Galaxy tablet, Google Nexus, and Android 4.0 (10" screen) and above.
- The high concurrency rate supports universal screening needs.

### Flexible and Supportive

*Math Inventory* provides flexible test accommodations and settings to support student needs, resulting in more reliable test measures.

- Students can choose to have questions and answer choices read aloud to ensure *Math Inventory* is testing math and not reading proficiency.
- Items can be read aloud in English or Spanish to support Spanish-speaking students.
- Growth mindset prompts are provided to encourage student effort and reduce test-taking anxiety throughout the assessment.

### Validated and Reliable

*Math Inventory* and the Quantile Framework for Mathematics have each undergone extensive reliability research to ensure accurate test results and connections to instruction.

- *Math Inventory* was awarded the highest rating for validity and reliability by the Center on Response to Intervention at American Institutes for Research in 2012.
- The Quantile Framework was developed based on the analysis of approximately 40,000 students in Grades 1–12 from 22 states during two national field studies.
- The items in the *Math Inventory* item bank were developed using the same protocol as was used for the development of items for the Quantile scale.
- The July 2019 *Math Inventory* release (version 3.1) included a broad revision of the item bank and algorithm, providing for further reliability and validity.

# Tracking Progress Toward College and Career

Success in algebra is the gateway to college and career readiness. *Math Inventory* helps monitor students' math progress from their early beginnings in Kindergarten onward to ensure that they are on a trajectory to lifetime math success.

## College and Career Readiness

The content standards of the Quantile Framework are the basis for assessment in *Math Inventory* and are closely aligned to standards for college and career readiness including the Common Core State Standards. *Math Inventory* provides tools that accelerate learning toward the goal of college and career readiness.

*Math Inventory* supports college and career readiness standards for mathematics by:

- Providing evidence of students' learning and growth over time
- Linking assessment to instruction to improve the overall quality of learning and teaching
- Tracking students' growth toward the goal of algebra and college and career readiness

## The Common Core State Standards

The Common Core State Standards consist of mathematical practices that apply to all grades, as well as grade-level content standards that identify what to teach and when to teach it.

The Standards for Mathematical Practice provide guidance about how to teach mathematical content and ensure that all students are engaged with mathematics in a rigorous and relevant manner. These mathematical practices equip students with the necessary tools to build a robust understanding of the increasingly challenging skills and concepts assessed in *Math Inventory*.

In addition to the Standards for Mathematical Practice, the Common Core State Standards also include three key instructional shifts:

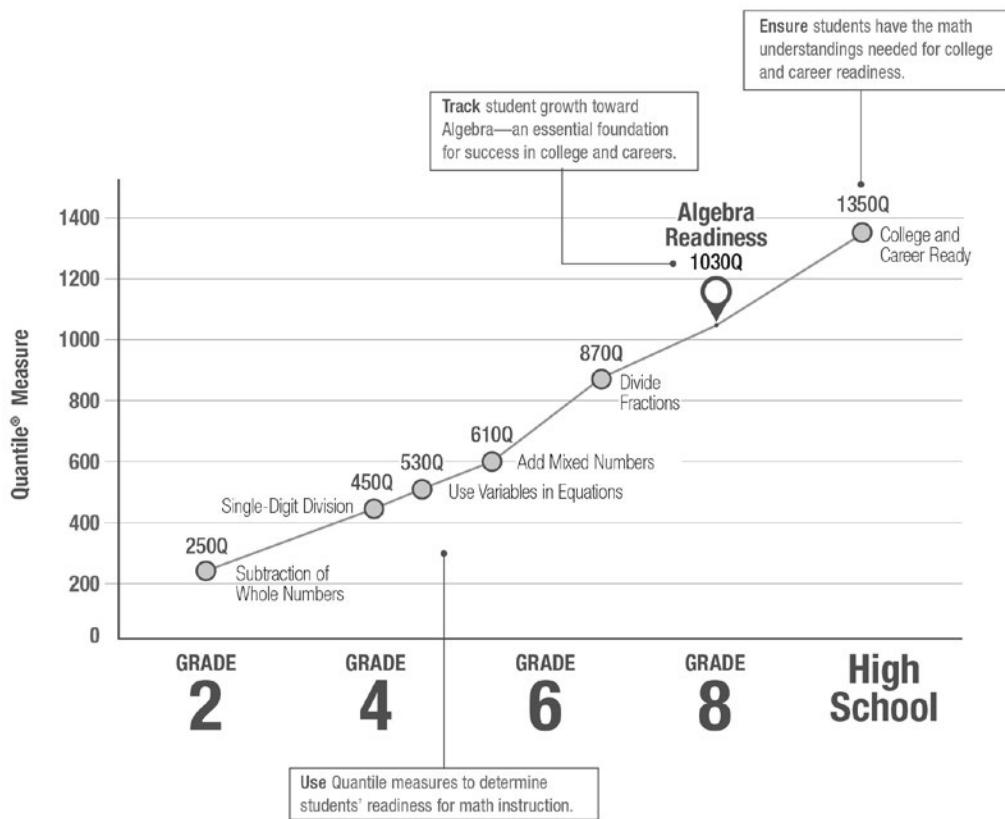
**Focus:** Narrow and deepen the curriculum to ensure that students build a strong mathematical foundation. Rather than covering lots of topics at the surface level, the standards focus on deep understanding of new content.

**Coherence:** Connect the learning within and across grades so that students make connections across topics. In this way each standard is not a new event but is, instead, an extension of previous learning.

**Rigor:** Teach conceptual understanding, procedural skill and fluency, and application with intensity to support students' ability to access concepts from a number of perspectives and apply understandings to real-world concepts.

## Understanding the Trajectory

*Math Inventory* is based on the Quantile Framework for Mathematics, a measurement system and taxonomy that quantifies mathematical complexity and mathematical understanding. Students receive a Quantile measure after they complete each *Math Inventory* assessment. Teachers use students' Quantile measures to monitor mathematical growth from Kindergarten onward. The graph below shows the Quantile measures that indicate Algebra I (1030Q) and college and career readiness (1350Q).



## Assessment Content

*Math Inventory* focuses on the standards and mathematical strands that are the most crucial on the trajectory toward college and career readiness. During the development of *Math Inventory*, its item bank was reviewed and enhanced to ensure that the topics assessed at each grade level were aligned with the grade-level goals of the Common Core State Standards and similar standards of college and career readiness. Additional items were developed to extend *Math Inventory*'s capability to determine readiness for instruction through Algebra II, a key indicator of college and career readiness.

## Data for College and Career Readiness

Increased alignment between the skills and concepts tested in *Math Inventory* and college and career readiness standards at each grade provides teachers with actionable data that can be used to inform instruction.

## Report Data

*Math Inventory* reports provide data to support instructional planning and monitor growth toward college and career readiness. The Instructional Planning Report and Progress to College and Career Report provide information to help teachers monitor students' progress on assessments across grades and toward benchmarks for Algebra II and college and career readiness. These reports then identify high-priority Quantile Skills and Concepts and corresponding Common Core State Standards to support individual and small-group instruction that is focused on these goals.



**INSTRUCTIONAL PLANNING**

### Instructional Planning Report

Class: 3rd Period

School: Williams Middle School  
Teacher: Sarah Foster  
Grade: 5  
Time Period: 12/13/18–02/22/19



**Math Inventory**

| Performance Level | Students            | Grade | Screening |      | Quantile® Measure | Date     | Test Time (min) | Normative Data  |     |         |
|-------------------|---------------------|-------|-----------|------|-------------------|----------|-----------------|-----------------|-----|---------|
|                   |                     |       | Addition  | Mult |                   |          |                 | Percentile Rank | NCE | Stanine |
| A                 | Gainer, Jacquelyn   | 5     | ●         | ●    | 906Q              | 02/22/19 | 35              | 95              | 85  | 8       |
| A                 | Cho, Henry          | 5     | ●         | ●    | 897Q              | 02/22/19 | 25              | 94              | 83  | 8       |
| A                 | ► Collins, Chris    | 5     | ●         | ●    | 853Q              | 02/22/19 | 12              | 90              | 77  | 8       |
| P                 | Kohlmeier, Ryan     | 5     | ●         | ●    | 772Q              | 02/22/19 | 40              | 73              | 63  | 6       |
| P                 | Cooper, Maya        | 5     | ●         | ●    | 772Q              | 02/22/19 | 37              | 73              | 63  | 6       |
| P                 | Enoki, Jeanette     | 5     | ●         | ●    | 766Q              | 02/22/19 | 39              | 71              | 62  | 6       |
| B                 | Hartsock, Shalanda  | 5     | ●         | ●    | 760Q              | 02/22/19 | 33              | 69              | 60  | 6       |
| B                 | Terrell, Walt       | 5     | ●         | ●    | 679Q              | 02/22/19 | 26              | 45              | 47  | 5       |
| B                 | Cocanower, Jaime    | 5     | ●         | ●    | 675Q              | 02/22/19 | 38              | 43              | 46  | 5       |
| B                 | Garcia, Matt        | 5     | ●         | ●    | 663Q              | 02/22/19 | 15              | 41              | 45  | 5       |
| B                 | Dixon, Ken          | 5     | ●         | ●    | 656Q              | 02/22/19 | 35              | 39              | 44  | 4       |
| B                 | Morris, Timothy     | 5     | ●         | ●    | 638Q              | 02/22/19 | 30              | 35              | 42  | 4       |
| B                 | ► Blume, Joy        | 5     | ●         | ●    | 630Q              | 02/22/19 | 9               | 33              | 41  | 4       |
| ■                 | Ramirez, Jeremy     | 5     | ●         | ●    | 602Q              | 02/22/19 | 37              | 28              | 38  | 4       |
| ■                 | ► Robinson, Tiffany | 5     | ●         | ●    | 577Q              | 02/22/19 | 9               | 24              | 35  | 4       |
| ■                 | Williams, Anthony   | 5     | ●         | ●    | 413Q              | 02/22/19 | 35              | 6               | 17  | 2       |

**KEY**

- EM Emerging Mathematician
- ADVANCED
- P PROFICIENT
- B BASIC
- BELOW BASIC
- INCOMPLETE TESTS

► Test taken in less than 15 minutes  
 ● Student may need to develop this skill  
 ● Student has acquired this skill

| YEAR-END PROFICIENCY RANGES |                    |                     |
|-----------------------------|--------------------|---------------------|
| GRADE K 9–117Q              | GRADE 5 645–771Q   | GRADE 9 1133–1214Q  |
| GRADE 1 117–232Q            | GRADE 6 785–890Q   | GRADE 10 1216–1248Q |
| GRADE 2 271–382Q            | GRADE 7 881–970Q   | GRADE 11 1216–1248Q |
| GRADE 3 381–545Q            | GRADE 8 1001–1089Q | GRADE 12 1216–1248Q |
| GRADE 4 534–629Q            |                    |                     |

| USING THE DATA  |  |
|---|--|
| <p><b>Purpose:</b><br/>This report provides instructional recommendations for students at each <i>Math Inventory</i> performance level.</p> | <p><b>Follow-Up:</b><br/>Use instructional recommendations to plan appropriate support for students at each level.</p> |

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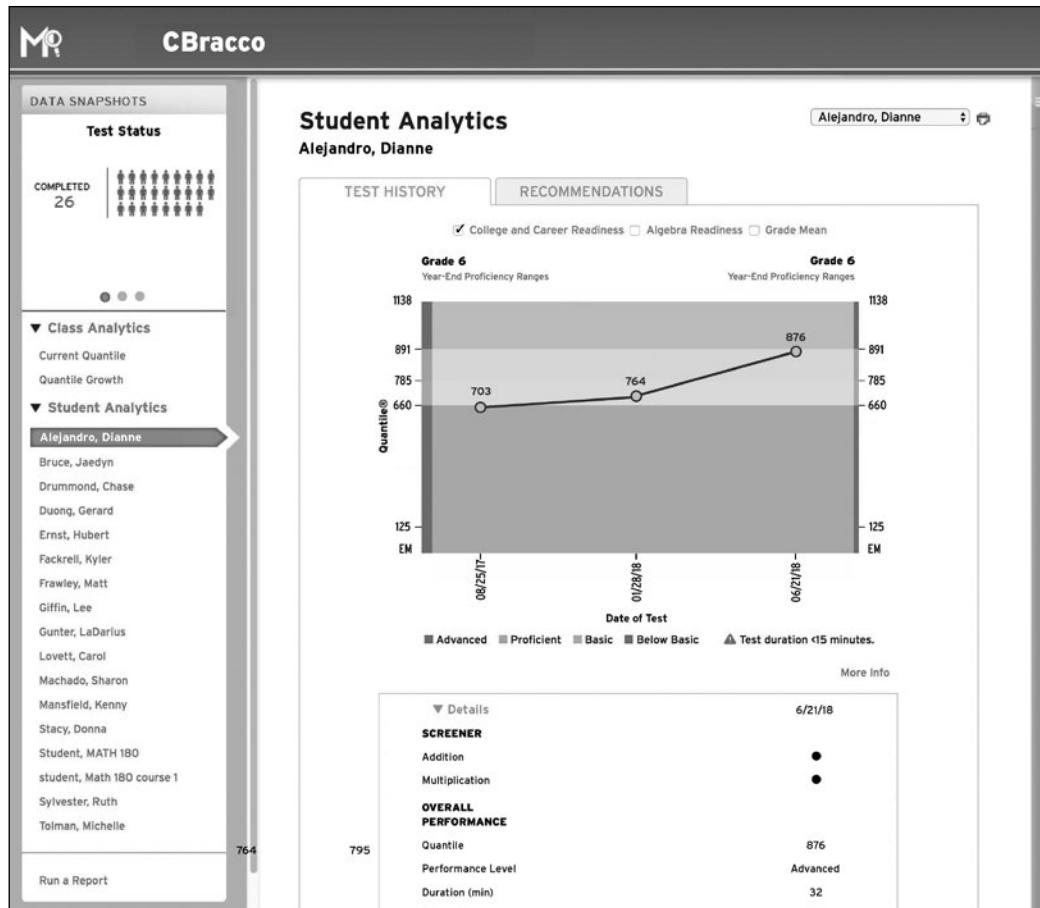
## SAM Central Data

The data snapshots and class and student analytics available in SAM Central help provide the immediate data needed to track student progress toward college and career readiness.

In SAM Central teachers can customize students' test history data to include specific benchmarks toward college and career readiness and then access professional learning resources to support instruction that is focused on those benchmarks.

### SEE ALSO

See **pages 98–105** for more information about SAM Central.



# Audio and Spanish Support

*Math Inventory* includes supports for struggling readers and Spanish-speaking students to ensure that they receive a fair and accurate assessment of mathematical achievement.

The screenshot shows a test item from the *Math Inventory*. At the top, there are language selection buttons for English (selected) and Español, along with Help, Skip, and Next buttons. The question asks how much longer Jill's stick is than Rosa's stick. It includes two ruler-like scales: one for Jill's Stick (length approximately 34 inches) and one for Rosa's Stick (length approximately 26 inches). Below the scales are four multiple-choice options: A) 18 inches, B) 12 inches, C) 9 inches, and D) 8 inches. At the bottom are Calculator and Formulas buttons.

## → TIP

Encourage struggling readers to select the option of having test questions and answer choices read aloud.

## Audio Support

The audio support feature provides students with support and control over test comprehension.

- Test directions are read aloud in English or Spanish.
- Students control when and how often they'd like to hear a question or answer choices read aloud.
- Students can replay a question and its answer choices as many times as needed.
- The audio support feature ensures the testing of math, not reading proficiency, leveling the field for struggling readers and nonreaders.

## Spanish Support

Test questions and answer choices can be read aloud in English or Spanish. This option can be selected by the student or at the district level.

- All instruction screens are offered in Spanish on screen as well as in audio.
- Teachers can direct Spanish-speaking students with limited English proficiency to select the Spanish Support feature at the start of the test.

## → TIP

Provide all students with headphones when administering *Math Inventory* to encourage the use of the Audio and Spanish Support features without calling attention to specific students.

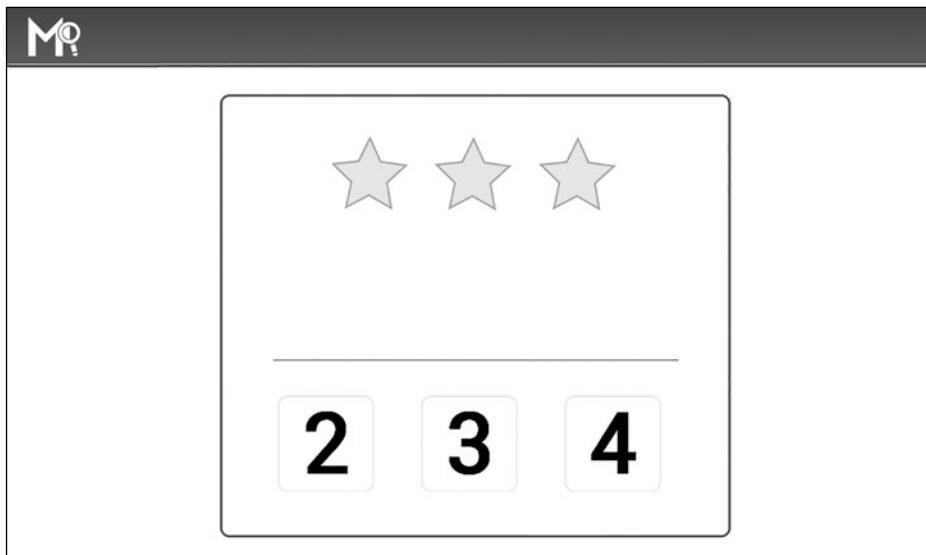
## Early Numeracy Screener

*Math Inventory* screens students in Kindergarten and Grade 1 to identify those that may need to develop early numeracy skills, such as counting and simple quantity comparisons. Students receive ten items from the Early Numeracy Screener before beginning the *Math Inventory* assessment. These items are designed to assess students' understanding of basic computational skills. Students who score below 80% should receive further mathematical instruction before taking *Math Inventory*. Students can still proceed to test if they score below 80%.

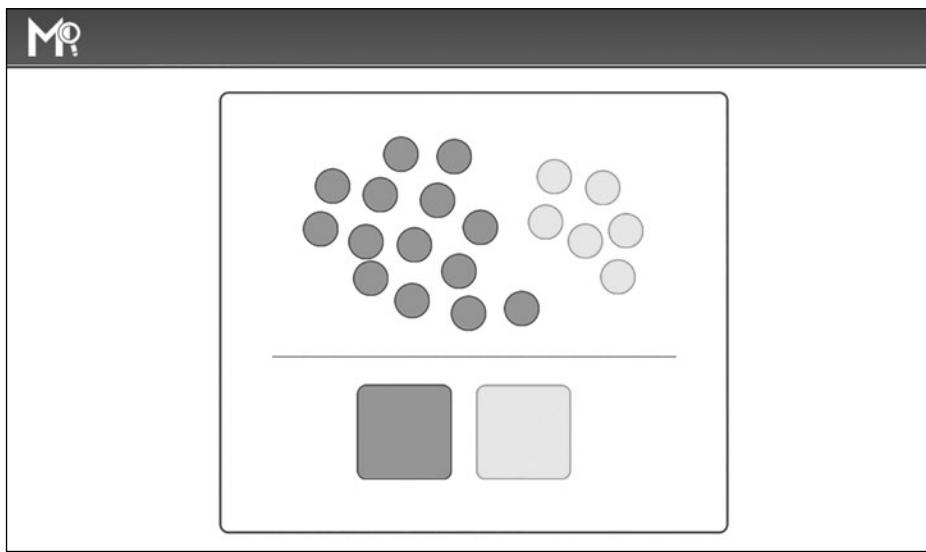
### SEE ALSO

See [page 36](#) for more information on experiencing the Early Numeracy Screener.

### STUDENTS RECEIVE FIVE COUNTING ITEMS



### STUDENTS RECEIVE FIVE QUANTITY COMPARISON ITEMS



# Fact Screener

The Fact Screener is an indicator of students who may need additional practice in building fluency with math facts.

## Overview

There are two Fact Screeners included in *Math Inventory*, the Addition Fact Screener and the Multiplication Fact Screener. Each screener contains ten items and is administered based on the student's grade. Common screener features:

- All students receive the Fact Screener during the first *Math Inventory* test of each new school year. Students who do not pass individual parts of the Fact Screener (Addition or Multiplication) will receive that portion again at the next administration of the test.
- Both screeners include simple instructions—written and read aloud—that explain the importance of answering math facts quickly and accurately to demonstrate automatic recall.
- Students begin with a Typing Warm-Up to locate the number keys.
- Students do not receive feedback on performance; results are available in SAM Central.
- Performance is reported separately from the results of *Math Inventory* and is not factored into students' overall Quantile measures.

### TIP

Remind students that this is the ONLY portion of the test that is timed, and they should complete it as quickly as possible.

## Addition Fact Screener

Students in Grade 2 and above receive ten items from the Addition Fact Screener.

- In Grades 2 and 3, the items display missing sums.
- In Grade 4 and above, items display missing addends, missing sums, and items with addends on both sides of the equation.

## Multiplication Fact Screener

Students in Grade 4 and above receive ten items from the Addition Fact Screener, followed by ten items from the Multiplication Fact Screener.

- Students in Grades 4 and 5 receive multiplication facts with missing products.
- Students in Grade 6 and above receive multiplication facts with missing products, missing factors, or items with products on both sides of the equation.

## Performance Levels

Students' Quantile measures, as reported by *Math Inventory*, group them in one of four performance levels in order to assist in instructional grouping and curriculum planning.

### Developing *Math Inventory* Performance Levels

*Math Inventory* performance levels were developed by a team of educational and assessment specialists. The Proficient performance level for each grade was set to correspond with college and career readiness standards as well as other national- and state-level performance information and was informed by mathematical content standards and frameworks developed by national organizations such as the National Council of Teachers of Mathematics (NCTM), the National Assessment of Educational Progress (NAEP), and the National Mathematics Advisory Panel report.

#### *Math Inventory* performance levels:

- **Advanced:** Students scoring in this range exhibit superior performance on grade-level-appropriate skills and concepts and, in terms of their mathematics development, may be considered on track for college and career.
- **Proficient:** Students scoring in this range exhibit competent performance on grade-level-appropriate skills and concepts and, in terms of their mathematics development, may be considered on track for college and career.
- **Basic:** Students scoring in this range exhibit minimally competent performance on grade-level-appropriate skills and concepts and, in terms of their mathematics development, may be considered marginally on track for college and career.
- **Below Basic:** Students scoring in this range do not exhibit minimally competent performance on grade-level-appropriate skills and concepts and, in terms of their mathematics development, are not considered on track for college and career.

#### SEE ALSO

See [page 48](#) to view a table of performance levels by grade.

For more information about how performance levels were determined, see the *Math Inventory Technical Guide*, available in SAM Central Downloadables.

### Instructional Planning with Performance Levels

Performance levels can be used to determine how to group students for instruction as well as to identify which students will need additional support with prerequisite skills in order to be successful with grade-level material.

Teachers can use SAM Central data analytics and reports to quickly gather performance grouping information by class, view instructional recommendations for each performance-level group, and access professional learning resources to plan differentiated instruction.

Districts can customize the reporting of student performance using three, four, or five levels.

#### SEE ALSO

See [page 95](#) for instructions on changing the district's reporting setting.

# Strand Profile

*Math Inventory* assesses understanding across five strands of mathematics with a focus on Numbers and Operations at the lower grades and Algebraic Thinking, Patterns, and Proportional Reasoning at the upper grades.

The five strands of mathematical content are:

- Number and Operations
- Algebraic Thinking, Patterns, and Proportional Reasoning
- Geometry, Measurement, and Data
- Statistics and Probability
- Expressions and Equations, Algebra, and Functions

## SEE ALSO

See the ***Math Inventory Technical Guide***, available in SAM Central **Downloadables**, for more information about how strand profiles were established.

## College and Career Readiness

Students receive a proportion of items from each strand according to each student's grade; this is referred to as the strand profile. The strand profile is informed by the Common Core State Standards and similar standards of college and career readiness that indicate where students and teachers should spend the majority of their time to meet college and career readiness expectations.

Students in Grades K–5 receive test items from only the first three strands listed above. Emphasis in these grades is on Number and Operations and on Algebraic Thinking, Patterns, and Proportional Reasoning. Beginning in Grade 6, emphasis shifts to Expressions and Equations, Algebra, and Functions, as well as Statistics and Probability, in order to assess college and career readiness.

# Reviewing Research and Validity

*Math Inventory* is a research-based system backed by proven validity and reliability measures.

## Validity and Reliability Measures

*Math Inventory* was awarded the highest rating for validity and reliability by the Center on Response to Intervention at American Institutes for Research in 2012. It recognized *Math Inventory* as a reliable universal screener, placement tool, and progress monitor that gives teachers the tools they need to help differentiate math instruction. *Math Inventory* received the highest rating based on convincing evidence for the following general outcome measures:

- **Reliability of Performance Level Score** *Math Inventory* data is stable, consistent, and dependable.
- **Validity of the Performance Level Score** *Math Inventory* measures what it purports to measure, and its theory is supported by its results.
- **End-of-Year Benchmarks** *Math Inventory* reports to grade-level expectations.
- **Rates of Improvement** *Math Inventory* is a growth-measurement tool.
- **Sensitive to Student Improvement** *Math Inventory* reports growth in hard-to-measure areas (high and low performances).
- **Alternate Forms** *Math Inventory* has a sufficiently robust item bank to produce comparable results for similar students.

## Demonstrating *Math Inventory* Reliability and Validity

*Math Inventory* also demonstrates high levels of reliability and validity as supported by the following:

- The reliability of the assessment as measured by marginal reliability calculations (most appropriate for computer-adaptive assessments) is 0.97.
- Test-retest reliability was computed with a methodology of staggered test administrations one week apart. The reliability coefficient was 0.78, well within the range deemed satisfactory by the educational measurement community.
- The content-description validity estimates for *Math Inventory* are based on the validity inherent to the Quantile Framework and its explicit connections to concepts and skills as described by national- and state-level mathematics standards documents.
- The construct-identification validity indicated expected age-related differences in *Math Inventory* performance.
- Expected differences are evident for students served by special education services and those identified as gifted/talented.
- The concurrent validity estimates for *Math Inventory* indicate that students' results on *Math Inventory* are satisfactorily correlated with their results on state assessments.

## Content-Description Validity

The content validity of a test refers to the adequacy with which relevant content has been sampled and represented in the test. The content validity of *Math Inventory* is based on the alignment between the content of the items and the curricular framework used to develop *Math Inventory*. Within *Math Inventory*, each item was aligned with a specific QSC in the Quantile Framework, which, in turn, has been aligned with the Common Core State Standards in Mathematics.

Content validity was also built into *Math Inventory* during its development. *Math Inventory* was designed to measure readiness for mathematical instruction from Kindergarten through Algebra II and to provide results that place students on the trajectory for college and career success. Test items were selected and reviewed to ensure that the content at each grade aligns to and represents the key priorities at each grade according to college and career readiness standards.

### SEE ALSO

Download information to learn more about the research foundations supporting *Math Inventory*.

- *Math Inventory Technical Guide* (in SAM Central **Downloadables**)
  - Quantile Briefing Document\*
  - An Investigation of Dimensionality\*
  - Professional papers\*
- \* From [hmhco.com/programs/math-inventory/research-results](http://hmhco.com/programs/math-inventory/research-results)

## Research and Validity Foundations

The Quantile Framework for Mathematics, developed by MetaMetrics, Inc., was selected as the foundation for *Math Inventory* because of its focus on research and validity and the ability to place students and instructional materials on the same scale. The Quantile Framework is aligned with national and state curricular frameworks and has been used to calibrate more than 300 national and state mathematics textbooks for use in Grade 1 through high school.

## Planning for *Math Inventory* Administrations



**TIP**  
Schedule curriculum planning following each *Math Inventory* administration in order to make data-driven decisions regarding instruction.

*Math Inventory* is designed to be administered three to five times per school year. Teachers should consider administering only three times per year to allow adequate time for growth and instruction.

### Establishing a Baseline Quantile Measure

Teachers should administer *Math Inventory* at the beginning of the school year to identify a baseline Quantile measure for each student. The baseline assessment serves as a universal screener for math intervention and enables teachers to work with students to create achievable math goals.

### Using *Math Inventory* for Growth Monitoring

Teachers should re-administer *Math Inventory* two to four times during the school year for growth monitoring, allowing at least 8 weeks between testing dates to ensure that students have adequate time to make meaningful gains.

### Steps for Success

Teachers should follow these steps when planning to administer *Math Inventory*:

1. Set three to five testing windows for the year, and communicate them to teachers and families.
2. Create a computer-lab, cart, or classroom rotation schedule for testing windows.
3. Enroll students and target estimated math levels before initial assessment.

### ► REFLECTION

Determine an appropriate *Math Inventory* assessment window for your district, school, or class:

- Beginning of year
- Midyear
- End of year

Professional Learning Guide

# **The Student Experience**

## Overview

Students complete 30 items across three to five strands of mathematics, with proportionate content determined by each student's grade level and item difficulty determined by student performance throughout the assessment. (If students are still working after 60 minutes and have completed 25+ questions, the test is considered complete.)

### → TIP

Provide students with scratch paper and pencil to work through problems. Collect scratch paper after the assessment to ensure that students are using it appropriately.

## Adaptive Testing

Students receive 5 on-grade-level items as an initial gateway. This gateway is designed to specifically identify a student's general math ability, resulting in an accurate starting point and appropriate items for students throughout the assessment.

Based on performance, item difficulty will fluctuate throughout the assessment. Specifically, *Math Inventory* uses students' performance on the first 5 items to determine the difficulty of the next 5 items, offering each student below-, on-, or above-grade-level items in response. It also offers items weighted to easier or more difficult strands. Additional batches of 5 items follow, using a similar adjustment process. The assessment will continue until the student completes 30 items (or 25 after 60 minutes of work). Students can receive challenging items from skill content up to one grade above their effective grade level and items from two grades below to measure achievement. This range of difficulty avoids students receiving items that are too easy or too hard.

## Easy Navigation

*Math Inventory* is designed with a clean and easy-to-navigate interface to accommodate students from Kindergarten through high school:

The screenshot shows a math problem about the cost of T-shirts. The problem states: "The table shows the costs of different numbers of T-shirts. What is the relationship between the number of T-shirts and the total cost?" Below the question is a table:

| Number of T-Shirts   | 1 | 2  | 3  | 4  | 5  |
|----------------------|---|----|----|----|----|
| Total Cost (dollars) | 8 | 16 | 24 | 32 | 40 |

Below the table are four multiple-choice options:

- (A) The total cost is one eighth times the number of T-shirts.
- (B) The number of T-shirts is eight times the total cost.
- (C) The total cost is eight times the number of T-shirts.
- (D) The total cost is eight more than the number of T-shirts.

At the bottom of the screen are two buttons: "Calculator" and "Formulas".

- Click the audio icon to hear the item read aloud.
- Choose the English or Spanish language read-aloud option.
- Click **Next** or **Skip** to progress through the assessment.

## Built-In Support Features

*Math Inventory* includes onscreen calculators and formula sheets to offer additional support on appropriate items. These features can be disabled by administrators for districts that do not use calculators or reference sheets on exams. When the purpose of the item is computational, the calculator is disabled automatically.

Chris Collins | Log Out

English Espanol ? Help Skip ➡ 3 Left Next ➡

4) Nina measured the length of books in her classroom. The lengths are shown. Which line plot correctly shows the measurements?

11,  $11\frac{1}{2}$ ,  $10\frac{1}{2}$ , 11,  $11\frac{1}{2}$ ,  $10, 11\frac{1}{2}$

(A) Length of Books  
 $\begin{array}{c} \times \quad \times \quad \times \quad \times \quad \times \\ 10 \quad 10\frac{1}{2} \quad 11 \quad 11\frac{1}{2} \quad 12 \\ \text{Inches} \end{array}$

(B) Length of Books  
 $\begin{array}{c} \times \quad \times \quad \times \\ \times \quad \times \quad \times \\ 10 \quad 10\frac{1}{2} \quad 11 \quad 11\frac{1}{2} \quad 12 \\ \text{Inches} \end{array}$

(C) Length of Books  
 $\begin{array}{c} \times \\ \times \quad \times \quad \times \\ 10 \quad 10\frac{1}{2} \quad 11 \quad 11\frac{1}{2} \quad 12 \\ \text{Inches} \end{array}$

(D) Length of Books  
 $\begin{array}{c} \times \quad \times \quad \times \quad \times \\ 10 \quad 10\frac{1}{2} \quad 11 \quad 11\frac{1}{2} \quad 12 \\ \text{Inches} \end{array}$

Calculator Formulas



**Calculators** are available for items written for Grade 2 and above.

**Formula Sheets** are available for items written for Grade 3 and above.



## Reducing Test Anxiety

Taking tests can be an overwhelming and sometimes stressful experience for students.

*Math Inventory*, in partnership with Mindset Works, has incorporated growth-mindset feedback throughout the assessment—to build resilience, promote strong test-taking skills, and motivate students to take the assessment seriously.

In addition, students can move through the assessment at their own pace and have the option to skip up to three questions without being penalized.

Share with students that you need to know what they do not understand as much as what they do. In addition, share with them that a successful *Math Inventory* assessment will have a score of about 50 percent correct answers and 50 percent incorrect answers, so if they encounter items they cannot answer, they should move on quickly. *Math Inventory* seeks to assess them with a 50% correct and 50% incorrect answers result.

## Assessment Completion

On average, students will complete the test in 20–35 minutes, though this can vary due to the adaptive nature of the assessment and the number of supports students select to use. When students have completed the assessment, they will be shown their Quantile measures and informed that the test is complete. You can turn off the test score in SAM Central so that students will see a completion screen but will not view their Quantile measures.



Students will complete the assessment at different times. Plan activities for students who have finished their assessment; the activities should be quiet enough that they will not distract students who are still working on *Math Inventory*.

## Assessment User Interface

*Math Inventory's* user interface was designed to be accessible for students as young as Kindergarten while still being age-appropriate for students entering Algebra II.

The assessment directions shown below, available in English and Spanish, highlight important assessment features, including how to:

- Select and change answer choices
- Move from one item to the next
- Hear the question or answer choices read aloud
- Choose the audio language for items read aloud
- Skip up to three items per test without penalty



Items written for  
Grades K–2 include  
images in color.

The screenshot shows a computer screen displaying the Math Inventory assessment software. At the top, there is a navigation bar with the user name "Chris Collins | Log Out" and several buttons: English (with a speaker icon), Español (with a speaker icon), Help (with a question mark icon), Skip (with a right arrow icon), and Next (with a right arrow icon). Below the navigation bar, there is a large rectangular box containing "Directions". Inside this box, the text reads: "Read each question and answer choices carefully." followed by "Select Your Answer" with options A, B, C, and D. It also includes "Go to the next Question" with a "Next" button and "Audio Read-aloud" with a speaker icon. At the bottom of the directions box, there is a section titled "You can skip a question" with a "Skip" button and the note "You can skip up to three questions."

## Assessment Features

The user interface includes easy-to-use features.

The screenshot shows a digital assessment platform. At the top, there are two rows of numbered circles: 1, 2 on the left and 5, 6, 7, 8 on the right. Below this is a header bar with the 'MO' logo, the name 'Chris Collins | Log Out', and language and help buttons. A progress bar indicates '3 Left'. The main area contains a math problem and four multiple-choice options labeled A, B, C, and D. Each option shows a number line from -10 to 10 with points P and R marked. A double-headed arrow between P and R indicates the distance between them. Below the options are 'Calculator' and 'Formulas' buttons. The problem asks which model shows the change in temperature from  $-8^{\circ}\text{F}$  to  $8^{\circ}\text{F}$ .

- 1 Log on:** Student logon provides an individualized adaptive assessment.
- 2 Log Out:** Students may log off of the test and return to resume the assessment within two weeks.
- 3 Audio:** Students can click the audio button to hear the text from question and answer choices read aloud in English or Spanish. Numbers and equations apart from text are not read aloud.
- 4 Answer choices:** Answers are always displayed in four-option multiple-choice format.
- 5 Language option:** Students can click English or Spanish to select language for directions and items read aloud.
- 6 Help:** This feature offers information regarding test features and navigation.
- 7 Skip:** Students may skip up to three items without penalty.
- 8 Next:** Encourage students to check their answers. Answer choices are not final until the student clicks Next.

## Using the Calculator

Students can access a calculator for assistance on any assessment item written for Grade 2 and above that is not specifically evaluating computation skills.

### Introduction and Practice

Students are introduced to the calculator and invited to practice using it before beginning the assessment. Encourage students who are new to online calculators to practice using the tools before beginning the assessment.

### Viewing the Calculator

The calculator will appear in the center of the screen and can be relocated by clicking and dragging it. There are two types of onscreen calculators. Students may be presented with either calculator, depending on the difficulty level of the item. Students are presented with a four-function calculator for items written at a Grades 2–5 level of difficulty and a modified scientific calculator for items written at Grade 6 level of difficulty and higher.



**TIP**  
Administrators in districts that do not allow students to use calculators on exams can disable the calculator in the SAM Central Settings. Disabling this feature will remove the icon from the assessment for all students. Student Quantile measure does not reflect the increased difficulty of items when the calculator is removed.



FOUR-FUNCTION CALCULATOR



MODIFIED SCIENTIFIC CALCULATOR

# Referencing the Formula Sheet

Students can access one of three formula sheets for each item based on the item's grade level. The formula sheet serves as a reference tool and is available whether or not the item requires a formula to solve for the answer. Administrators can disable the Formula Sheet tool for a whole district in SAM Central Settings.

The screenshot shows a math problem and a formula sheet. The problem asks for the least number of additional books Library 2 must collect to have more books per student than Library 1. It provides four options: A) 50 books, B) 51 books, C) 61 books, and D) 130 books. Below the problem is a table:

|          | Library 1 | Library 2 |
|----------|-----------|-----------|
| Students | 120       | 80        |
| Books    | 420       | 230       |

The formula sheet contains formulas for various shapes and concepts, including:

- Area:** Triangle:  $A = \frac{1}{2}bh$ , Parallelogram:  $A = bh$ , Trapezoid:  $A = \frac{1}{2}(b_1 + b_2)h$ , Circle:  $A = \pi r^2$ , Circumference of a circle:  $C = 2\pi r$  or  $C = \pi d$ .
- Volume:** Cube:  $V = s^3$ , Prism:  $V = Bh$ , Pyramid:  $V = \frac{1}{3}Bh$ , Cylinder:  $V = \pi r^2 h$ , Cone:  $V = \frac{1}{3}\pi r^2 h$ , Sphere:  $V = \frac{4}{3}\pi r^3$ .
- Other:** Pi ( $\pi \approx 3.14$  or  $\pi \approx \frac{22}{7}$ ), Simple Interest:  $I = Prt$ , Pythagorean Theorem:  $a^2 + b^2 = c^2$ .

## → TIP

Disabling this feature will remove the icon from the assessment for all students. Student Quantile measure does not reflect the increased difficulty of items when the formula sheet is removed.

## Accommodating a Range of Difficulty

*Math Inventory* includes three different formula sheets to accommodate test items that range in difficulty from Kindergarten through college and career readiness. Only one formula sheet will be presented per item. The formula sheet presented is determined by the grade level of the item.

**GRADES 3–5 LEVEL**

Perimeter  
Square:  $P = 4s$   
Rectangle:  $P = (2 \times l) + (2 \times w)$

Area  
Square:  $A = s \times s$   
Rectangle:  $A = l \times w$

Volume  
Cube:  $V = s \times s \times s$   
Rectangular prism:  $V = B \times h$  or  $V = l \times w \times h$

**GRADES 6–8 LEVEL**

Area  
Triangle:  $A = \frac{1}{2}bh$   
Parallelogram:  $A = bh$   
Trapezoid:  $A = \frac{1}{2}(b_1 + b_2)h$   
Circle:  $A = \pi r^2$   
Circumference of a circle  
 $C = 2\pi r$  or  $C = \pi d$

Surface Area  
Prism: SA = sum of the areas of all faces  
Pyramid: SA = sum of the areas of all faces  
Cylinder: SA =  $2\pi r^2 + 2\pi rh$

Volume  
Cube:  $V = s^3$   
Prism:  $V = Bh$   
Cylinder:  $V = \pi r^2 h$   
Cone:  $V = \frac{1}{3}\pi r^2 h$   
Sphere:  $V = \frac{4}{3}\pi r^3$

Pythagorean Theorem  
 $c^2 = a^2 + b^2$

**GRADES 9 AND ABOVE**

Distance Formula  
 $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Pythagorean Identity  
 $\sin^2 \theta + \cos^2 \theta = 1$

Law of Sines  
 $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

Law of Cosines  
 $a^2 = b^2 + c^2 - 2bc \cos A$   
 $b^2 = a^2 + c^2 - 2ac \cos B$   
 $c^2 = a^2 + b^2 - 2ab \cos C$

Heron's Formula  
 $A = \sqrt{(s-a)(s-b)(s-c)}$  where  
 $s = \frac{1}{2}(a+b+c)$

Quadratic Formula  
Solution of  $ax^2 + bx + c = 0$  is  
 $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

## Taking the *Math Inventory* Assessment

Learn how students access *Math Inventory* on test day, and then use either the Software Simulator during Professional Learning or a Test Student logon to experience the assessment from a student's perspective.

### → TIP

Create a Test Student account to walk through the assessment interface with students before administration. Delete all Test Student accounts before administering the actual assessment.

## Accessing the Technology

Guide students to log on to *Math Inventory* through the **Student Access Screen** by following these steps:

1. Open an internet browser, such as Internet Explorer, Chrome, Firefox, or Safari.
2. Click **Bookmarks** at the top of the browser window. Select the bookmark for the Student Access Screen.
3. Use **Usernames & Profiles** under **Manage Class** in SAM Central to give students their usernames and passwords to log on to *Math Inventory* from the **Student Access Screen**.



## The Student Perspective

It is helpful to experience the assessment from the student perspective before administering it to your students. Younger students may benefit from a sample test walk-through of a few items to help them feel more comfortable with the assessment before working independently.

During *Math Inventory* Professional Learning, you will have the opportunity to use the *Math Inventory* Software Simulator. The Software Simulator allows you to experience the practice test, Fact Screener, and a sampling of test items without having access to your school or district's *Math Inventory* software. The Software Simulator provides Tips with explanations or directions to guide your experience.

### Keep in mind the following tips:

- The simulated test has a sampling of 5 sixth-grade test items. On the actual test, students complete 25–30 items. If they are still working after 60 minutes, and have completed 25+ items, the test is considered complete. If they have completed fewer than 25, the test produces a message to come back and finish another time.
- Read the Tips when they appear. Click the **x** in the upper right corner of each Tip to close it.
- Think about how to prepare students for the question format and testing experience.

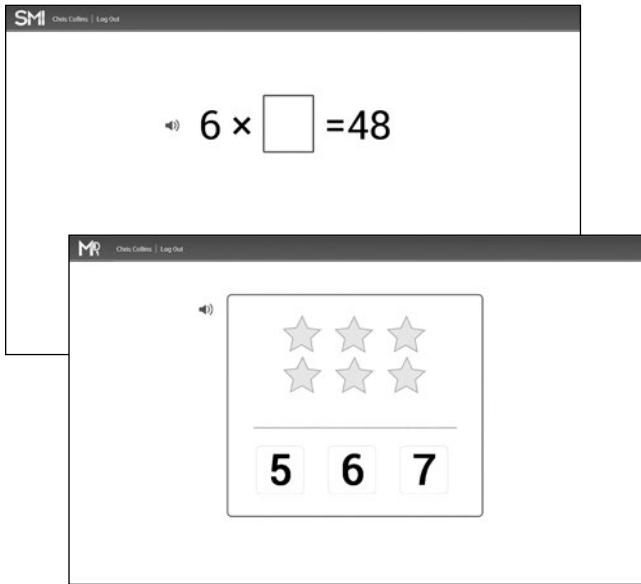
If using the software and a Test Student account to experience the student perspective, remember to delete the Test Student account and all test data before enrolling students in *Math Inventory* and administering the assessment.

**To experience the assessment from the student perspective, log on with a unique username and password, and then follow the instructions on pages 36 and 37.**

# The Student Experience

## Complete the Screeners

If using a Kindergarten or Grade 1 Test Student account, complete the Early Numeracy Screener. In the Software Simulator or a Test Student account for Grade 2 and above, complete the Fact Screener at an appropriate level of difficulty.

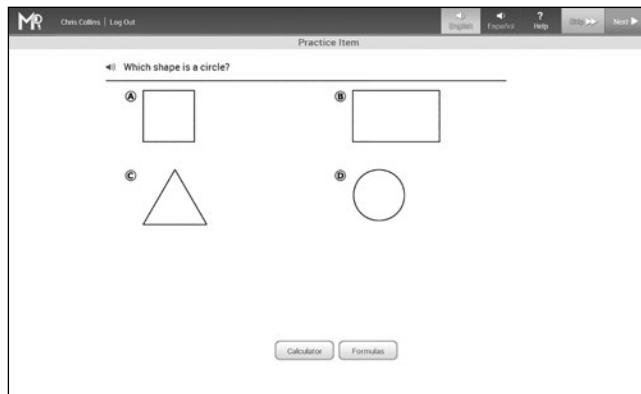


### DIRECTIONS

1. Select the correct number of stars in part one of the Early Numeracy Screener. In part two you will be asked to choose which color tile has more stars.
2. During the Typing Test warm-up in the Fact Screener, type the number displayed on the screen. Complete four typing items in the Simulator or ten items if using a Test Student account.
3. When the Fact Screener starts, type the answer to each fact displayed on the screen as fast as you can and then press Enter or click **Next**. Students respond to ten math facts in each operation during the assessment.

## Take a Practice Test

Follow the instructions and take a practice test with sample items.



### DIRECTIONS

1. Read and listen to the assessment directions.
2. Practice using the calculator and formula sheet. Then click **Next** to begin the Practice Test.
3. Click **OK** and answer the practice questions, one at a time. You will receive three practice questions.
4. If you answer the practice questions incorrectly during the practice test, a message will pop up indicating that the student should see the teacher for help.
5. You will then receive two additional practice items before starting the test.

### → TIP

Students will receive the practice questions only on the first *Math Inventory* assessment of the school year. You can change this default in the Settings to present practice questions on all *Math Inventory* tests.

## Take a *Math Inventory* Assessment

Take a modified *Math Inventory* assessment with five questions from Grade 6 on the Software Simulator. If using a Test Student account, you will answer 30 items. (The test will end after 25 items if a student is still working after 60 minutes.)

The screenshot shows a math problem: "Andy polled customers at the movie theater about the amount of money they spend each week on entertainment. His findings are shown in the histogram. How many customers participated in Andy's poll?" Below the question is a histogram titled "Weekly Entertainment Spending" with the following data:

| Spent (in Dollars) | Number of Customers |
|--------------------|---------------------|
| 5                  | 11                  |
| 10                 | 11                  |
| 15                 | 5                   |
| 20                 | 2                   |
| 25                 | 1                   |
| 30                 | 1                   |
| 35                 | 1                   |

Below the histogram is a digital calculator interface with buttons for Clear, backspace, numbers 0-9, arithmetic operators (+, -, ×, ÷), and a decimal point (.). At the bottom are "Calculator" and "Formulas" buttons.

### DIRECTIONS

1. Read each question. Then select the correct answer by clicking the corresponding letter.
2. Click the **Calculator** or **Formulas** buttons in the bottom center of the screen, when available, to access tools that can help you solve the problem.

### → TIP

Remind students that they can use paper and pencil to help them solve problems.

## View Results

View a results screen with your Quantile measure. The Software Simulator will display a sample results screen.

The screenshot displays a message box containing the text: "Thank you, Chris Collins. You have finished the test. Your Quantile score is 870Q. Select Next to exit." Below the message box is a large, faint "Next" button.

### DIRECTIONS

1. View your sample Quantile measure in the Software Simulator or your real Quantile measure on a Test Student account.
2. Click **Next** to log off of *Math Inventory*.

### → TIP

If students exit *Math Inventory* before completing the assessment, the software saves their answers. They can return another day and complete a saved test by logging on with their username and password.

### ► REFLECTION

I will help students understand their Quantile measures by . . .

## Viewing Assessment Results

When students complete *Math Inventory*, they are presented with their Quantile measures. Use SAM Central data analytics to view students' Quantile measures immediately following the assessment.

### Understanding Assessment Results

*Math Inventory* assessment results report directly on the Quantile Framework for Mathematics, a scientifically based system for matching students to math content. The score, reported as a Quantile measure, gives you the information you need to accurately determine what students are ready to learn rather than just what they do not know. Targeting math instruction and support to a student's readiness for instruction builds confidence and lays the groundwork for ongoing success with mathematics.

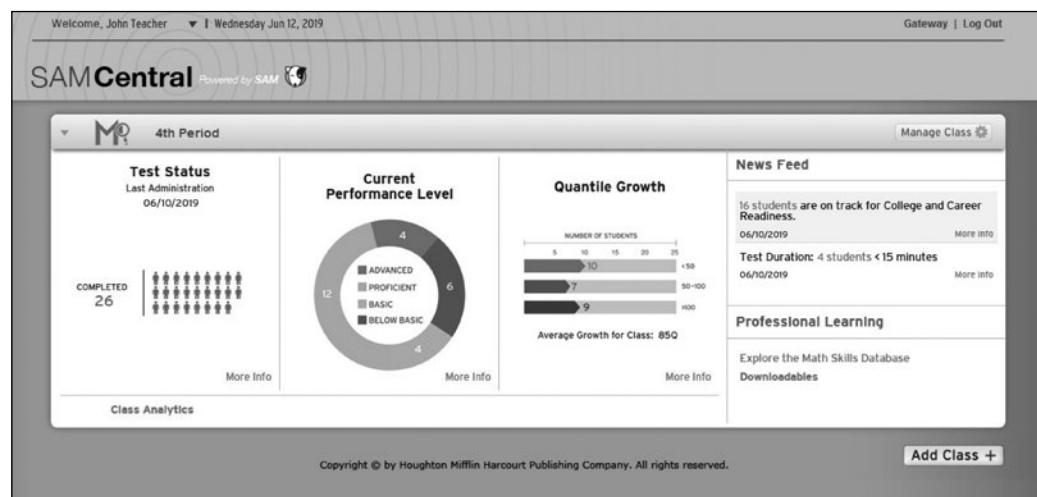
### Generating Results

A Quantile measure indicates a student's current readiness for math instruction and also tracks growth through Algebra II and college and career readiness. After *Math Inventory* assessment, access *Math Inventory* class data analytics and snapshots in SAM Central to view students':

- Early Numeracy Screener or Fact Screener results
- Quantile measures, including performance and usage data
- Normative data

#### → TIP

View results in SAM Central following the test window to determine which students may need to complete or retake the assessment.



Professional Learning Guide

# **Understanding the Quantile Framework**

## Overview

The Quantile Framework for Mathematics is a scale that describes a student's mathematical readiness and the difficulty of specific mathematical skills and concepts ([www.Quantiles.com](http://www.Quantiles.com)).

### Developing the Quantile Framework

The framework was created in 2004 after extensive research, development, and a national field study. This scientifically designed and research-based measure of mathematical understanding places students and instructional materials on the same scale.

### Key Features of the Quantile Framework

The Quantile Framework for Mathematics is a taxonomy of more than 500 math skills and concepts ranging from Kindergarten through pre-calculus. Quantile Skills and Concepts (QSCs) do not represent every math skill and concept but rather only those that are *most important for accelerating math development* from Kindergarten through high school on the trajectory toward college and career readiness.

Both content and student achievement are measured along a single scale and identified by a number called a Quantile measure. When the Quantile measure of the content and the student are matched (i.e., the Quantile measures are the same number), the student experiences increased confidence and control.

A student's Quantile measure identifies a range of appropriate content, from review material to new challenges at the edge of the student's learning frontier. Correctly targeting this range of appropriate content is essential to growth in the student's math skills and understanding. By correctly identifying each student's Quantile measure and then providing appropriately leveled instruction and practice, teachers can systematically move students forward through increasingly difficult material.

The Quantile Framework for Mathematics is powerful because it:

- Links students' readiness for instruction to mathematics skills and concepts
- Aligns to the Common Core State Standards and individual state standards
- Provides a quantifiable trajectory to algebra and beyond

# Understanding Quantile Measures

A Quantile measure is the specific number assigned to a mathematical skill or concept. Once measured, a specific skill or concept takes an invariant position on the Quantile Leveled Mathematics Framework in relation to every other skill or concept included on the framework. Understanding a QSC's position on the framework helps you to target instruction, bridge the gaps, and appropriately challenge students.

## SEE ALSO

For more information on planning instruction with Quantile measures, see [pages 120–122](#).

## Targeting the Learning Frontier

Matching instructional materials to a student's Quantile measure reduces frustration and increases math confidence and the likelihood for success with the new instructional content. When a student's Quantile measure is within 50Q of the target skill or concept, the instruction is considered to be in the student's learning frontier. A student receiving instruction within his or her learning frontier is appropriately challenged for maximum engagement, and the following is likely to occur for that student:

- Background knowledge needed to learn and apply the new information will be available.
- Skills and concepts that are the focus of the instruction should be accessible.
- Following instruction, the student will be able to solve problems utilizing the target skills.

## Bridging the Gap

When a target skill or concept's Quantile measure is more than 50Q *above* the student's Quantile measure, the student may encounter so many unfamiliar skills and difficult concepts that the learning is frequently lost. Scaffold the introduction of core grade-level instruction with prerequisite skills and concepts to bridge the gap for these students, increasing the likelihood of success with the target skill.

## Motivating and Challenging Students

Use Quantile measures to motivate students by matching their level of mathematical understanding with instruction on skills and concepts for which they are likely to have the prerequisite skills and concepts necessary for understanding. Provide extension activities to challenge those who measure more than 50Q above that of the target skill or concept.

## Criterion- and Norm-Referenced Results

### → TIP

The Quantile measure of a skill or concept is invariant because the skill or concept does not change; therefore, the mathematical demand to understand the skill or concept will not change.

*Math Inventory* provides both criterion- and norm-referenced results. Criterion-referenced results indicate a student's knowledge or skills as determined by a fixed measure. Norm-referenced results indicate how a student's performance compares with the performance of other students (a changing measure).

### Criterion-Referenced Results

A Quantile measure is criterion-referenced in the following two ways:

1. It tells you at what level *the student* is ready to be instructed on grade-level-appropriate skills and concepts. One metric, the Quantile measure, is used to assess the student's mathematical understanding, making it easy to chart the student's growth over the years.
2. It provides an invariant and fixed measure—*the Quantile measure of a skill or concept*—against which you can interpret a student's test results and mathematical growth.

### Grade-Level Ranges and Performance Levels

To provide another familiar context in which to interpret Quantile measures, *Math Inventory* offers other criterion-referenced results, such as grade-level ranges and performance levels. A student's Quantile measure corresponds to the grade-level range at which the student is demonstrating proficiency in mathematics. *Math Inventory* reports tell you whether the student is ready for instruction on skills and concepts that are on, above, or below grade level. The reports also indicate the student's performance level (Below Basic, Basic, Proficient, Advanced)—the level of proficiency with which the student is able to successfully solve mathematical tasks at that grade.

### → TIP

A ruler uses inches and feet to measure how tall a child is and how much the child has grown. The Quantile measure works in much the same way, giving an accurate picture of mathematics growth.

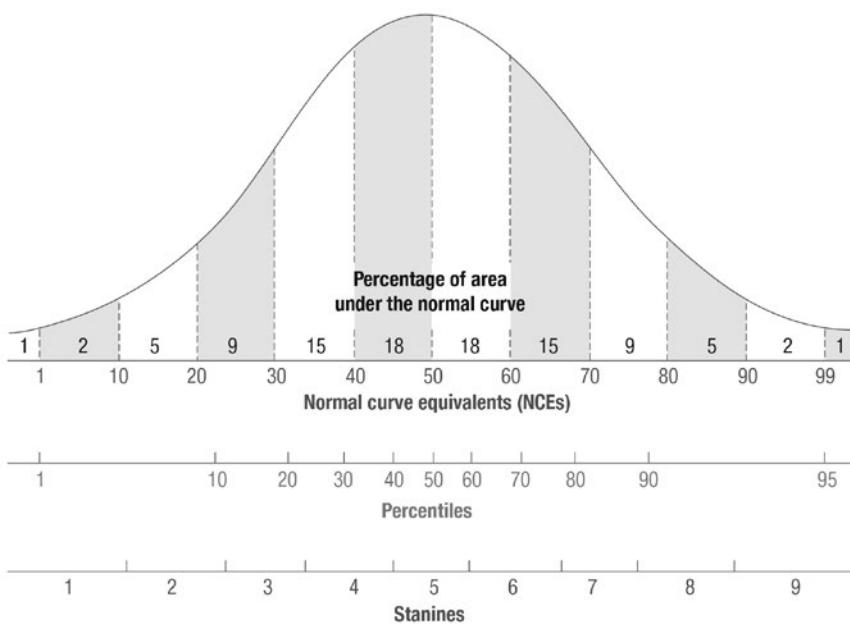
### State Standards and Frameworks

Not only are the skills and concepts described by the QSCs fixed measures against which to interpret a student's level of achievement, but they are also aligned with the Common Core State Standards and state curriculum frameworks. For example, if a fourth-grade student's Quantile measure matches that of QSC165 ("Multiply 2- and 3-digit whole numbers by a 1-digit whole number or a 2-digit multiple of 10."), then the teacher knows from experience with teaching this material in Grade 4 that the student is ready for instruction on this skill. Because the Quantile measure is applied to skills and concepts associated with curriculum frameworks, teachers can interpret students' test results in a concrete way—by looking at the tasks the student should be able to successfully solve after instruction.

## Norm-Referenced Results

Norm-referenced interpretations of test results, often required for accountability purposes, indicate how well the student's performance on the assessment compares with similar students' results. *Math Inventory* norm-referenced results are determined by the performance of other students in the school or other students on the server. Three norm-referenced metrics are represented in *Math Inventory* reports:

1. Normal curve equivalents (NCEs)
2. Percentile rank
3. Stanines



### SEE ALSO

Other state assessments and nationally normed tests have been linked with the Quantile Framework as well. Go to [www.quantiles.com](http://www.quantiles.com) to see whether your state assessments are linked.

## Normal distribution of scores described in percentiles, stanines, and NCEs

- **Normal curve equivalent (NCE)** is a normalized student score with a mean of 50 and a standard deviation of 21.06. NCEs range from 1 to 99.
- **Percentile rank** is a score that tells what percentage of students in a particular group received equal or lower scores than this student. Percentile ranks range from 1 to 99. For example, if a student scores at the 65th percentile, it means that he or she performed as well as or better than 65 percent of the norm group.
- A **stanine** is a standardized score with a mean of 5 and a standard deviation of 2. Stanines range from 1 to 9. In general, stanines of 1 to 3 are considered below average, stanines of 4 to 6 are considered average, and stanines of 7 to 9 are considered above average.

### SEE ALSO

For more information on the linking study conducted with the Quantile Framework to develop normative data, see the *Math Inventory Technical Guide*, [page 53](#).

## QSC Knowledge Clusters

The Quantile Framework is a taxonomy of related skills and concepts; each skill or concept, referred to as a QSC, builds off of and extends to others. These relationships form Knowledge Clusters.

### SEE ALSO

Go to [www.quantiles.com](http://www.quantiles.com) to view more examples of Knowledge Clusters.

### Types of QSCs in a Knowledge Cluster

Each Knowledge Cluster, or grouping of related skills and concepts, in the Quantile Framework consists of the following types of QSCs:

- **Target QSC:** The skills or concepts you plan to teach
- **Supplemental QSCs:** The related skills and concepts that support students with the target skill. Supplemental QSCs can have a QMeasure above or below the Target QSC in a Knowledge Cluster.
- **Prerequisite QSCs:** The foundational skills or concepts that students need to know in order to achieve success with the target skill or concept. Prerequisite QSCs have a lower QMeasure than the Target QSC in a Knowledge Cluster.
- **Impending QSCs:** The skills or concepts that extend student learning from the target skill or concept. Impending QSCs have a greater QMeasure than the Target QSC.

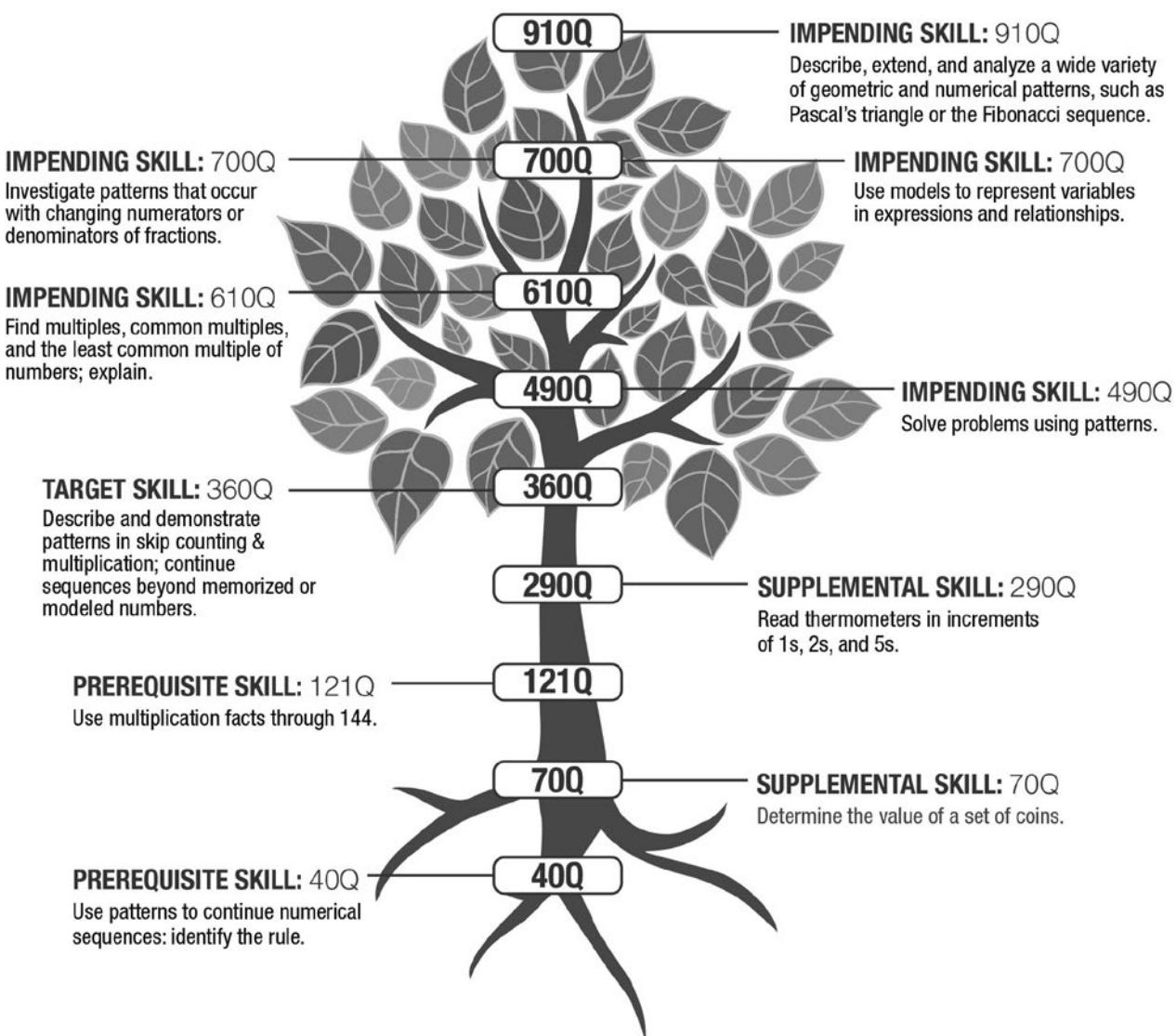
Knowledge Clusters show the connections between mathematical skills and give their relative difficulty to one another using the Quantile scale. The QSCs connect to each other forming an enormous web of mathematics skills and concepts related through their content and their measures. The web of content spans content from Kindergarten through secondary school mathematics ([www.quantiles.com](http://www.quantiles.com)).

## Visualizing a Knowledge Cluster

One way to “visualize” a Knowledge Cluster is to think of a tree. The prerequisite skills are foundational skills, representing the roots of the tree. Supplemental skills support and reinforce math concepts across topics. These skills help students build on what they already know to achieve success with the target math. The trunk is the target skill—the concept or skill you plan to introduce to your students during any given lesson. Advancing mathematics skills and concepts are dynamic and complex, requiring students to build on learned understandings and knowledge. In a Knowledge Cluster, the impending QSCs are skills and concepts that extend learning from the target QSC. In this regard, impending QSCs are similar to tree branches as they continue to grow and extend from a tree’s strong foundation.

### SEE ALSO

For more information on planning with Knowledge Clusters, see [page 127](#).



## Reflecting on the Quantile Framework

### ► UNDERSTANDING KEY TERMS

Think about the key terms from the Quantile Framework and refer to [pages 40–45](#) to determine the following:

- How is the term new to me?
- How is the term familiar to me?

### Quantile Framework Terminology

Write down how the following terms are new or familiar to you and one thing you would like to remember or that you found surprising about each aspect of the Quantile Framework.

#### QUANTILE MEASURE

#### KNOWLEDGE CLUSTER

#### PREREQUISITE QSC

#### SUPPLEMENTAL QSC

#### IMPENDING QSC

Professional Learning Guide

# **Results and Data Analytics**

# Understanding Assessment Results

Use data-rich reports to review *Math Inventory* test results and create benchmark goals to help students meet expectations for grade-level proficiency.



**TIP**

The lowest possible score is also called LOSS (Lowest Obtainable Scale Score). The highest possible score is also called HOSS (Highest Obtainable Scale Score). These caps produce more accurate results for 99 percent of students.

## Performance Levels by Grade

*Math Inventory* results and data analytics provide a Quantile measure and correlated performance level for students on each *Math Inventory* administration. This data helps to group students for instruction, identifying at what level of mathematics complexity they are ready to engage and how well they are likely to engage with core grade-level material. Below is a table of the end-of-year Quantile measure ranges for each performance level by grade.

You can use the Below Basic and Advanced columns as a reference when reviewing individual student growth. Because *Math Inventory* caps both the lowest and highest possible scores in a grade level, about 1 percent of students will show a capped score across multiple tests. In other words, a 4th grader scoring at 90 will receive a score of EM110, which is the lowest possible score for a 4th grader. At the next administration, the student may score 100, but *Math Inventory* will still report a score of EM110, because that is the lowest possible score for a 4th grader. The student's progress toward the fourth-grade range will not be visible. When you see lowest or highest possible scores across multiple test administrations, you should look to additional data points to determine the student's actual readiness level and plan appropriate instruction.

| Grade     | Below Basic  | Basic       | Proficient  | Advanced     |
|-----------|--------------|-------------|-------------|--------------|
| <b>K</b>  | EM244 – EM75 | EM74 – 8    | 9 – 117     | 118 – 295+   |
| <b>1</b>  | EM235 – 15   | 16 – 116    | 117 – 232   | 233 – 384+   |
| <b>2</b>  | EM233 – 141  | 142 – 270   | 271 – 382   | 383 – 600+   |
| <b>3</b>  | EM151 – 276  | 277 – 380   | 381 – 545   | 546 – 815+   |
| <b>4</b>  | EM110 – 389  | 390 – 533   | 534 – 629   | 630 – 929+   |
| <b>5</b>  | 77 – 539     | 540 – 644   | 645 – 771   | 772 – 1045+  |
| <b>6</b>  | 125 – 659    | 660 – 784   | 785 – 890   | 891 – 1138+  |
| <b>7</b>  | 393 – 752    | 753 – 880   | 881 – 970   | 971 – 1141+  |
| <b>8</b>  | 422 – 845    | 846 – 1000  | 1001 – 1089 | 1090 – 1296+ |
| <b>9</b>  | 680 – 977    | 978 – 1132  | 1133 – 1214 | 1215 – 1459+ |
| <b>10</b> | 705 – 1003   | 1004 – 1215 | 1216 – 1248 | 1249 – 1509+ |
| <b>11</b> | 705 – 1003   | 1004 – 1215 | 1216 – 1248 | 1249 – 1509+ |
| <b>12</b> | 705 – 1003   | 1004 – 1215 | 1216 – 1248 | 1249 – 1509+ |

# SAM Central | Overview

SAM Central includes comprehensive class- and student-level data to use in monitoring students' growth and performance on *Math Inventory*. Use SAM Central's interactive data analysis tools to track student progress toward mastery with college and career and grade-level standards, provide differentiation, and monitor student performance.

The screenshot shows the SAM Central interface for a class named "4th Period".

- Test Status:** Last Administration on 06/10/2019. 26 students completed the test.
- Current Performance Level:** A donut chart showing student distribution across four levels: Advanced (4), Proficient (12), Basic (6), and Below Basic (4).
- Quantile Growth:** A bar chart showing student growth in quantiles. The x-axis represents the number of students from 5 to 25. The bars show growth for three categories: <15 minutes (7 students), 15-100 (9 students), and >100 (1 student).
- News Feed:** Alerts about student readiness and test duration.
- Professional Learning:** Options to explore the Math Skills Database and Downloadables.

## FEATURES

- **The SAM Central home screen** includes three data snapshots—Test Status, Current Performance Level, and Quantile Growth—which provide high-level usage and performance data.
- **Pop-up windows** with point-of-use class-level data will appear when you click on any part of a data snapshot. All pop-ups include alerts for students that finish the assessment in less than 15 minutes, which may indicate a lack of focus resulting in inaccurate Quantile measures and the need to retake the assessment.
- **Student Analytics** are displayed by clicking on the student name in the pop-up window.
- **More Info** explains what the data represents and provides recommendations for follow-up.

## SAM Central | Analytics

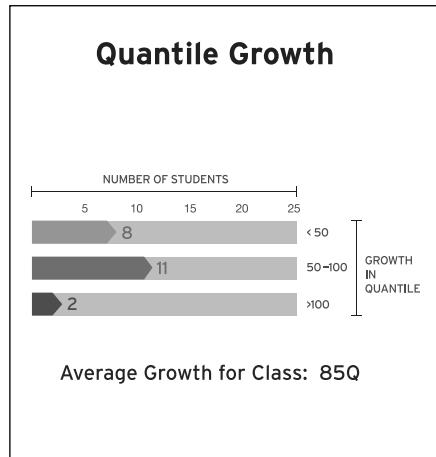
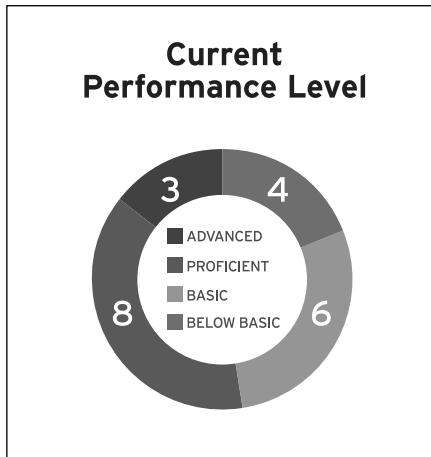
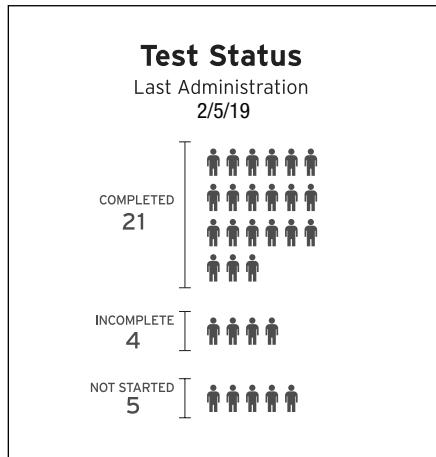
SAM Central home screen includes high-level data snapshots displaying students' assessment results and usage data. Click on different data snapshots to view pop-ups with detailed information.

The screenshot shows the SAM Central interface. At the top, it displays "Welcome, John Teacher" and the date "Wednesday Jun 12, 2019". On the right, there are "Manage Class" and "Log Out" buttons. The main area features a "Test Status" section with a bar chart showing "COMPLETED 26" and a grid of student icons. Below this is a "Current Performance Level" box for "BASIC" level, listing students Cho, Henry; Chamberland-Washington, Alexander; and Enoki, Jeanette, with scores 620, 577, and 572 respectively. A note indicates "Test duration <15 minutes." To the right is a "News Feed" sidebar with items like "16 students are on track for College and Career Readiness" and "Test Duration: 4 students <15 minutes". At the bottom left is a "Class Analytics" button, and at the bottom right is an "Add Class +" button. The footer copyright notice reads "Copyright © by Houghton Mifflin Harcourt Publishing Company. All rights reserved."

The SAM Central home screen includes key features that highlight class- and student-level usage and performance data and provide information on next steps for teachers, including:

- **Data Snapshots:** Quickly view high-level data snapshots following assessment to monitor class and student performance and progress at a glance.
- **News Feed:** Find important assessment information bubbled up to guide next steps for data analysis.
- **Professional Learning:** Link to resources to assist in instructional planning using Quantile measures.
- **Class Analytics:** Compare detailed assessment results and monitor usage and a student's trajectory to algebra and college and career readiness.
- **Student Analytics:** View detailed student test data to track students' trajectory toward algebra and college and career readiness and plan individualized instructional support.
- **Printable Reports:** Print separate PDF reports to track students' overall growth in mathematics.

# SAM Central | Data Snapshots



## TEST STATUS

Use this data snapshot to view students' last test administration status and identify students who may need to take or complete the assessment.

### Features

- Completed:** These students are ready for targeted instruction using Quantile measures.
- Incomplete:** These students need to return and complete the current assessment or retake the assessment after the current incomplete assessment has been deleted in the Class Settings.
- Not Started:** These students need to be scheduled to take *Math Inventory*.

### TIP

Students need to log on within two weeks of the original test date to complete the assessment. Incomplete assessments can be deleted by teachers in the Class Settings.

## CURRENT PERFORMANCE LEVEL

Use this data snapshot to view students' *Math Inventory* performance levels based on their latest *Math Inventory* assessment results. Click on the red and yellow sections to view a list of students who may require support with grade-level instruction.

### Features

- Advanced and Proficient (Green):** Number of students who demonstrated a readiness to learn math content at or above their current grade level
- Basic (Yellow):** Number of students who demonstrated a readiness to learn math content one or more years below their current grade level
- Below Basic (Red):** Number of students who demonstrated a readiness to learn math content two or more years below their current grade level

## QUANTILE GROWTH

Use this data snapshot to view students' Quantile growth between their first and most recent test administrations in the current school year.

### Features

- Top Bar:** Students with limited growth since first test administration may require more targeted intervention unless they are already proficient.
- Middle Bar:** Continue working with these students to maintain and increase growth.
- Bottom Bar:** Continue working with these students to maintain growth.
- Average Growth for Class:** Provides an average of Quantile measure growth for all students in the class who completed at least two tests.

### TIP

These ranges are not an indication of expected growth for students.

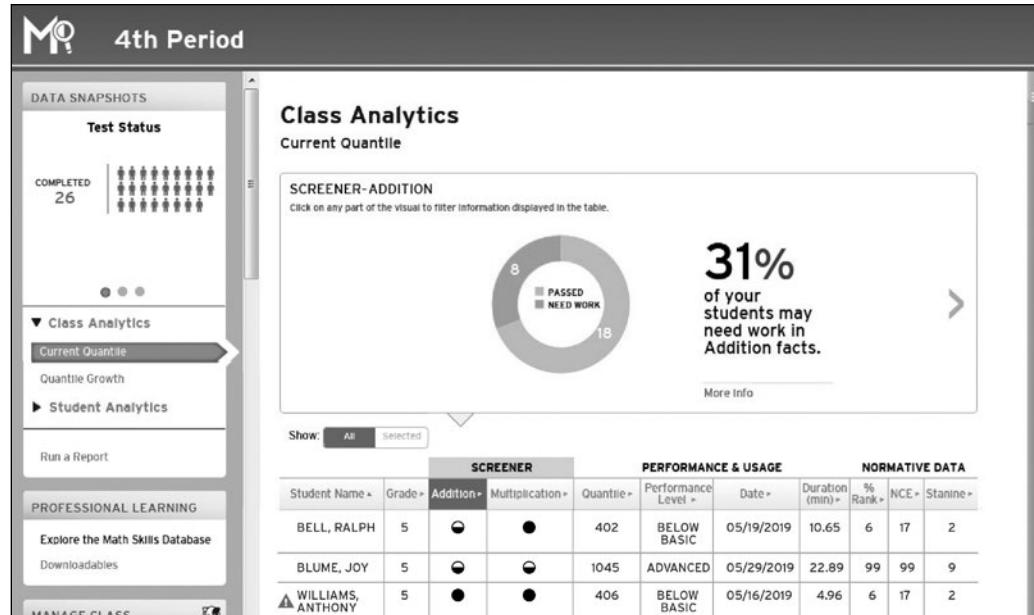
## Class Analytics | Current Quantile

Current Quantile Class Analytics provide actionable class-level data to display the results of the most current *Math Inventory* administration in both norm- and criterion-referenced terms.

### → TIP

Navigate the Current Quantile page in three ways:

- 1. Click** on the left and right **slide arrows** to move from one visual to the next.
- 2. Click** on the visual to filter information displayed in the table beneath.
- 3. Click** on the **column headers** in the table to sort the data.

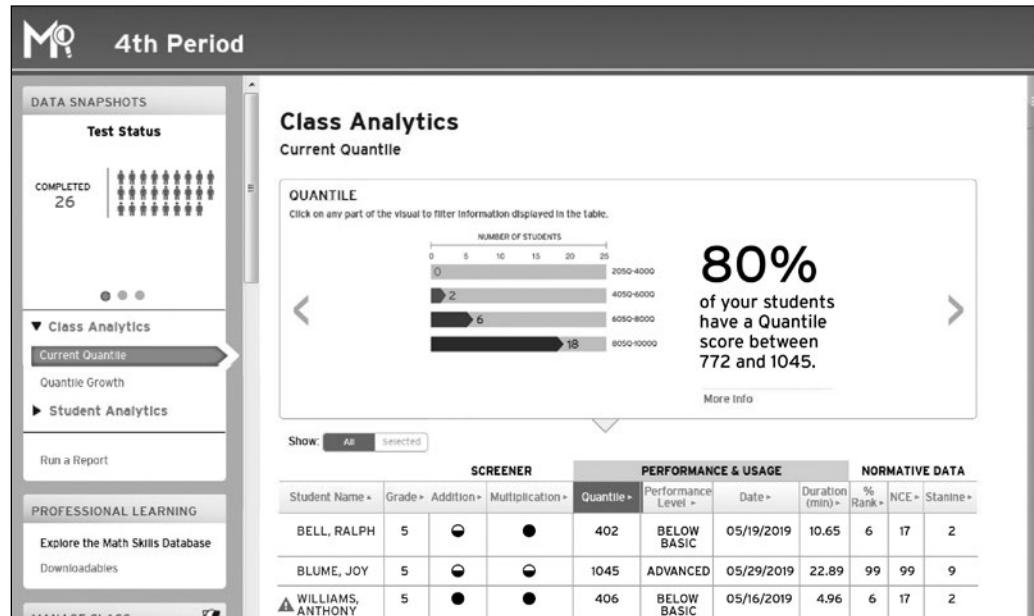


**ADDITION AND MULTIPLICATION SCREENERS** display the number and percentage of students who passed each screener. Click on a student's name in the table to view test history and see the date on which the student passed each part of the screener.

### → TIP

The ability to quickly retrieve math facts frees up working memory to focus on higher-order math skills necessary for college and career readiness.

Target students that do not pass the screeners for additional support with quick math fact retrieval.



**QUANTILE** displays the number of students in each of four Quantile measure ranges.

# Class Analytics | Current Quantile

Use the Current Quantile Class Analytics to group students for differentiated instruction and monitor test completion dates.

**DATA SNAPSHTOS**

**Test Status**

COMPLETED 26

**Class Analytics**

Current Quantile

Quantile Growth

Student Analytics

Run a Report

**PROFESSIONAL LEARNING**

Explore the Math Skills Database

Downloadables

MANAGE CLASS

**Class Analytics**

Current Quantile

**PERFORMANCE LEVEL**

Click on any part of the visual to filter information displayed in the table.

15% of your students are in the Basic Performance Level.

**SCREENER**

| Student Name      | Grade | Addition | Multiplication | Quantile | Performance Level | Date       | Duration (min) | % Rank | NCE | Stanine |
|-------------------|-------|----------|----------------|----------|-------------------|------------|----------------|--------|-----|---------|
| BELL, RALPH       | 5     | ●        | ●              | 402      | BELOW BASIC       | 05/19/2019 | 10.65          | 6      | 17  | 2       |
| BLUME, JOY        | 5     | ●        | ●              | 1045     | ADVANCED          | 05/29/2019 | 22.89          | 99     | 99  | 9       |
| WILLIAMS, ANTHONY | 5     | ●        | ●              | 406      | BELOW BASIC       | 05/16/2019 | 4.96           | 6      | 17  | 2       |



## TIP

Use *Math Inventory* performance levels to group students for instruction. For more information on small-group instruction, see [page 124](#).

**PERFORMANCE LEVEL** displays the number of students grouped into each of the four *Math Inventory* performance levels. Click on any of the four parts of the visual to filter the information below.

**DATA SNAPSHTOS**

**Test Status**

COMPLETED 26

**Class Analytics**

Current Quantile

Quantile Growth

Student Analytics

Run a Report

**PROFESSIONAL LEARNING**

Explore the Math Skills Database

Downloadables

MANAGE CLASS

**Class Analytics**

Current Quantile

**DATE**

Click on any part of the visual to filter information displayed in the table.

100% of your students took their last test more than 3 months ago.

**SCREENER**

| Student Name      | Grade | Addition | Multiplication | Quantile | Performance Level | Date       | Duration (min) | % Rank | NCE | Stanine |
|-------------------|-------|----------|----------------|----------|-------------------|------------|----------------|--------|-----|---------|
| BELL, RALPH       | 5     | ●        | ●              | 402      | BELOW BASIC       | 05/19/2019 | 10.65          | 6      | 17  | 2       |
| BLUME, JOY        | 5     | ●        | ●              | 1045     | ADVANCED          | 05/29/2019 | 22.89          | 99     | 99  | 9       |
| WILLIAMS, ANTHONY | 5     | ●        | ●              | 406      | BELOW BASIC       | 05/16/2019 | 4.96           | 6      | 17  | 2       |



## TIP

Use this information to identify students who have not completed the most recent *Math Inventory* administration and schedule those students to take *Math Inventory*.

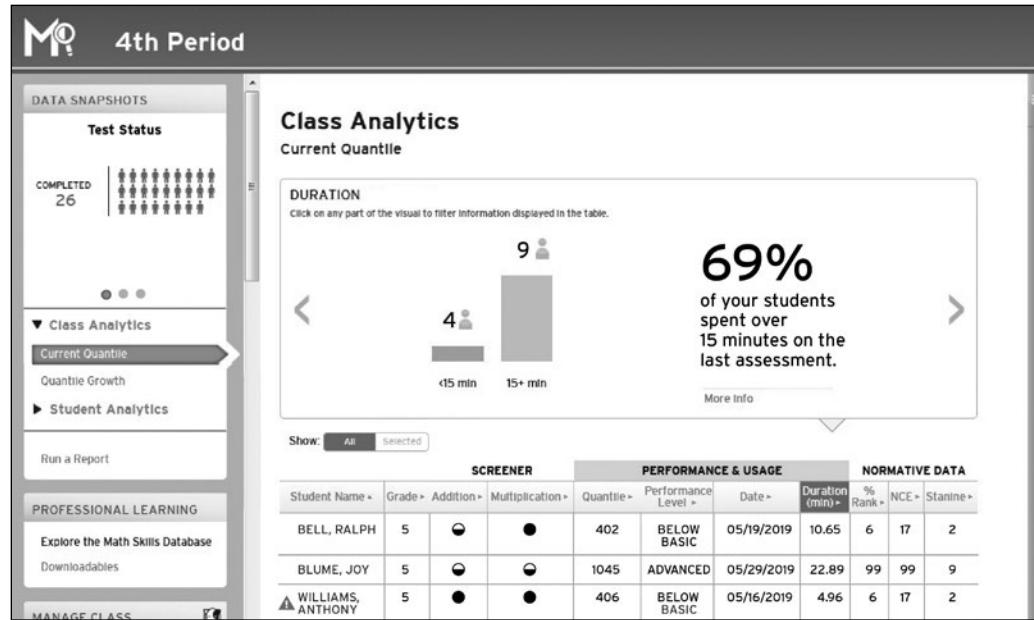
**DATE** displays the number of students who completed their most recent *Math Inventory* assessment this month, one to three months ago, and more than three months ago. View the exact date of each student's assessment in the table beneath.

## Class Analytics | Current Quantile

Use the Current Quantile Class Analytics to filter data by test duration or percentile rank.

### → TIP

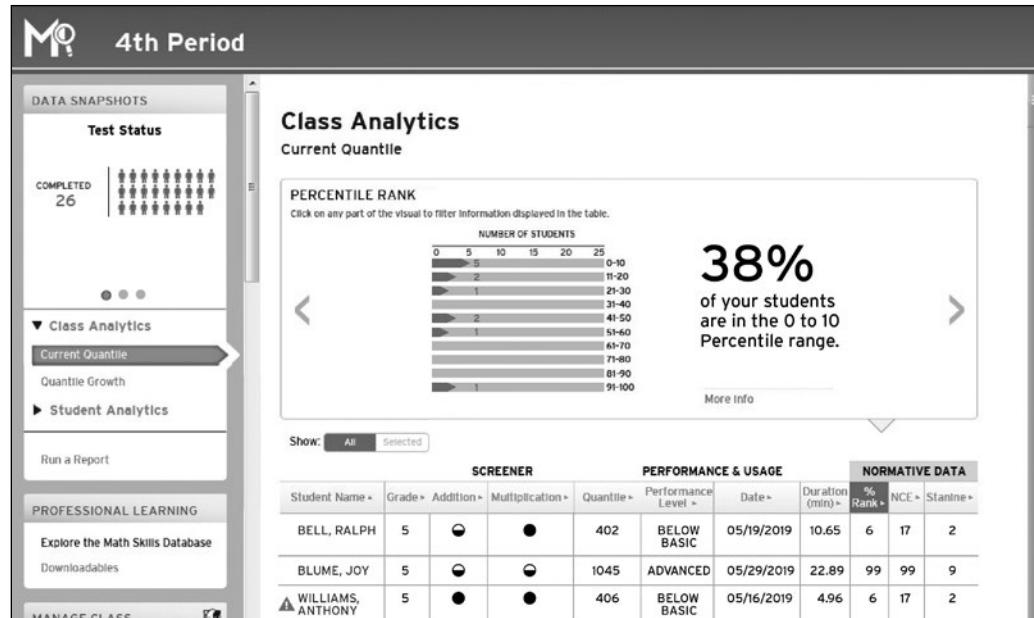
Conference with students with test duration of less than 15 minutes to determine whether they put forth their best effort. To obtain more accurate results, re-administer the assessment to those students who were not focusing on the current test.



**DURATION** Compare the number of students who spent less than 15 minutes on the assessment versus those who spent 15 minutes or more. Single-digit test durations may be an indication of students not taking the test seriously. View, filter, and sort duration by minutes in the table beneath.

### → TIP

If a majority of your students scored in the 80th percentile, that means they performed as well as or better than 80 percent of their peers. Target students at the low end of the percentile range for additional support.



**PERCENTILE RANK** View the number of students who scored in each percentile rank. This demonstrates how students scored in comparison to their peers who took *Math Inventory*.

# Class Analytics | Current Quantile

Use the Current Quantile Class Analytics for accountability and resource planning decisions.

The screenshot shows the '4th Period' dashboard. On the left, a sidebar includes 'DATA SNAPSLOTS' (Test Status: COMPLETED 26), 'Class Analytics' (Current Quantile selected), 'Quantile Growth', 'Student Analytics', 'Run a Report', 'PROFESSIONAL LEARNING' (Explore the Math Skills Database, Downloadables), and 'MANAGE CLASS'. The main area displays 'Class Analytics' with 'Current Quantile' selected. It features a 'NCE' chart showing student distribution across tenth percentile ranges (0-10, 11-20, etc.) and a text overlay stating '<1% of your students are in the 0 to 10 NCE range.' Below this is a 'SCREENER' section with columns for Student Name, Grade, Addition, Multiplication, Quantile, Performance Level, Date, Duration (min), % Rank, NCE, and Stanine. Three student rows are listed: BELL, RALPH (Grade 5, Addition: 1, Multiplication: 1, Quantile: 402, Performance Level: BELOW BASIC, Date: 05/19/2019, Duration: 10.65, % Rank: 6, NCE: 17, Stanine: 2); BLUME, JOY (Grade 5, Addition: 1, Multiplication: 1, Quantile: 1045, Performance Level: ADVANCED, Date: 05/29/2019, Duration: 22.89, % Rank: 99, NCE: 99, Stanine: 9); and WILLIAMS, ANTHONY (Grade 5, Addition: 1, Multiplication: 1, Quantile: 406, Performance Level: BELOW BASIC, Date: 05/16/2019, Duration: 4.96, % Rank: 6, NCE: 17, Stanine: 2).

**NORMAL CURVE EQUIVALENT (NCE)** View the number and percentage of students that scored in the normal curve equivalent for every tenth percentile.

The screenshot shows the '4th Period' dashboard. The sidebar and 'Class Analytics' section are identical to the previous screenshot. The main area displays 'Class Analytics' with 'Current Quantile' selected. It features a 'STANINE' chart showing student distribution across stanines (1, 2, 3, 4, 5, 6, 7, 8, 9) and a text overlay stating '30% of your students are in the 2 Stanine.' Below this is a 'SCREENER' section with columns for Student Name, Grade, Addition, Multiplication, Quantile, Performance Level, Date, Duration (min), % Rank, NCE, and Stanine. The same three student rows are listed as in the previous screenshot.

**STANINE** View the number and percentage of students that scored in each of the stanines ranging from 1 to 9.



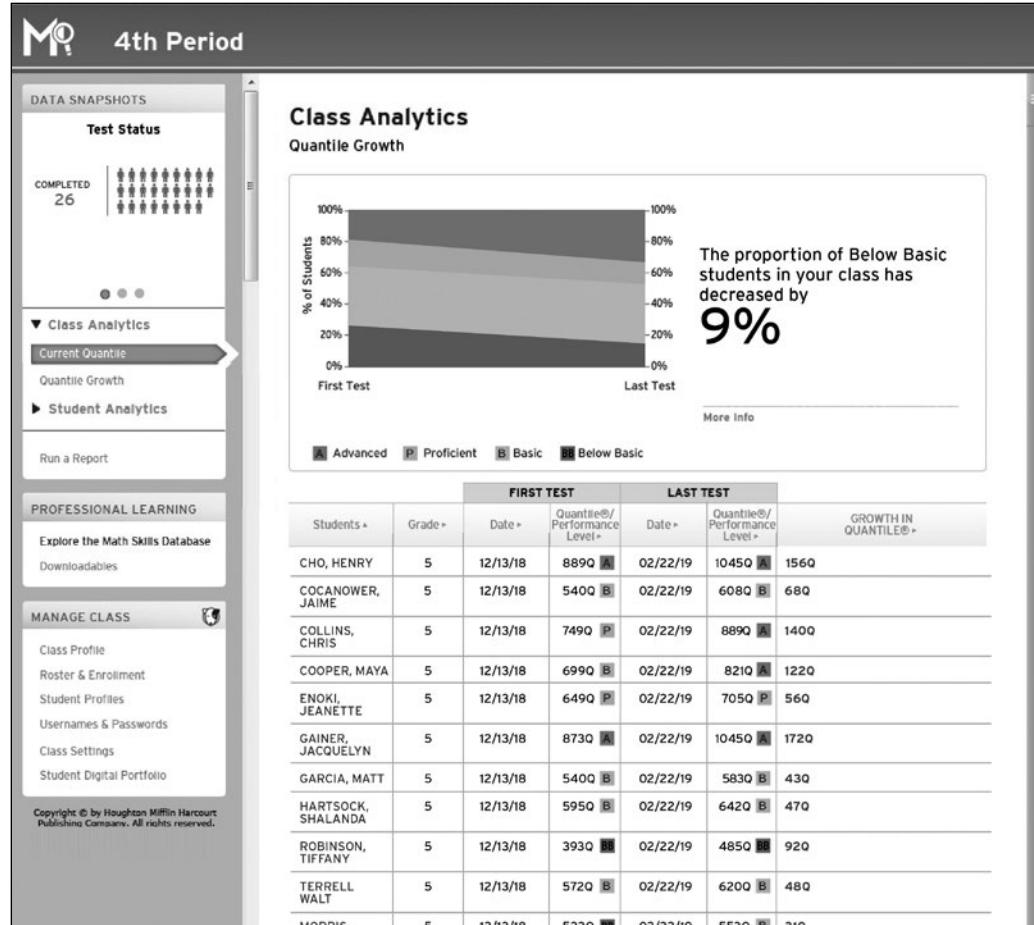
**TIP**  
Use normative data to inform resource planning and program evaluation needs.

## Class Analytics | Quantile Growth

Use Class Analytics Quantile Growth to view how the distribution of students by performance level has changed between the first test and the last test in the school year. Following targeted intervention, we expect to see the proportion of students in the Below Basic band shrink and other bands expand.

### → TIP

Look for the most current research reports and publications regarding expected student growth in the **Downloadables** section under **Professional Learning** in SAM Central.



# Class Analytics | Quantile Growth

It is expected that, over the course of a school year, students will demonstrate growth on *Math Inventory*. Growth may be measured against end-of-year proficiency benchmarks.

## UNDERSTAND QUANTILE GROWTH

1. Scroll over each performance level band in the graph to view the percentage increase or decrease for students in that group in your class.
2. Refer to the table to view growth in Quantile measures by student.
3. Click on individual student names in the table to view a test history graph of growth with benchmarks.

With appropriate instruction and support, most students may be expected to reach end-of-year proficiency benchmarks. However, individual differences may influence the pace and trajectory of growth for given students.

You may notice more subtle shifts of data in the graph if a majority of your students are Proficient or Advanced at the start of the school year. These students should still make individual gains following instruction; however, their overall Quantile measure growth may not be as great as that of students receiving targeted intervention and support.

## ► REFLECTING ON CLASS ANALYTICS

How do the Data Snapshots and Class Analytics change the way you understand assessment results and plan instruction?

## SAM Central | Student Analytics

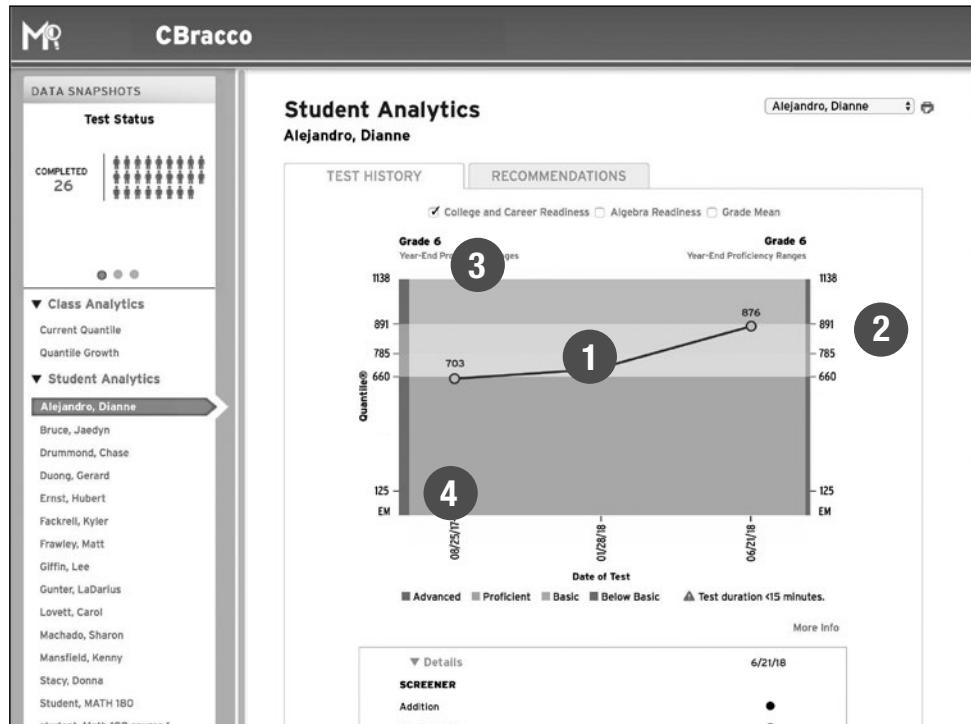
Select any student's name from Class Analytics to view comprehensive data on individual students' *Math Inventory* performance and growth.

### Test History Graph

View a line graph of the student's test history with optional benchmarks included.  
Scroll down to view a table of screener and overall performance data.

#### SEE ALSO

See [page 22](#) for an explanation of ways to customize student performance reporting.



# SAM Central | Student Analytics

Use Student Analytics to better understand individual students' Quantile measure growth and trajectory to college and career.

## UNDERSTAND THE TEST HISTORY

- ① **Line Graph** of student's Quantile measure performance on *Math Inventory* test administrations: Use the graph to view student's progress toward specific benchmarks.
- ② **Performance Levels** for the student's current grade: The student's test dates will be displayed against expected grade-level performance and growth.
- ③ **Benchmarks** to include on the line graph in order to view student's trajectory toward college and career readiness: Check the boxes to include benchmarks or uncheck to remove benchmarks from the line graph. Compare the student's Quantile measure growth to the grade mean for students who completed the most recent *Math Inventory* administration.
- ④ **Date of Test** includes all test dates from the current and past school years. Use this data to monitor student growth across grades.



*Math Inventory* 3.1 produces a more accurate starting point for students at the beginning of the school year and greater stability in measurement of growth, especially at the high and low ends. Because of these adjustments, it's most useful to compare data from *Math Inventory* 3.1 test administrations to other 3.1 administrations, rather than to previous versions of the assessment. As always, you should examine closely any scores that are inconsistent with your knowledge of a student's abilities and progress.

## SAM Central | Student Analytics

View recommended skills and concepts for instruction and aligned Common Core State Standards. The recommendations are organized by the five strands of mathematical content included in *Math Inventory*. These skills and concepts for instruction are those most crucial for accelerating achievement toward Algebra II and college and career readiness according to the student's Quantile measure on the most recent completed assessment.

### SEE ALSO

For more information on searching the Math Skills Database for recommended skills and concepts for instruction, see [pages 130–133](#).

The screenshot shows the SAM Central interface for a student named Baldwin, Christy. On the left, there's a sidebar with 'DATA SNAPSHTOS' and 'Test Status' showing 'COMPLETED 26'. Below that are sections for 'Class Analytics' (Current Quantile, Quantile Growth) and 'Student Analytics' (listing students: BAILEY, LORI; BALDWIN, CHRISTY; BURTON, BENJAMIN; BURTON, RICKY; CAMPBELL, MABEL; CARR, ANTONIO; CONNER, KYLE; DIXON, REED). An arrow points from the 'BALDWIN, CHRISTY' entry in the sidebar to the main content area. The main content area is titled 'Student Analytics' and shows 'Baldwin, Christy'. It has tabs for 'TEST HISTORY' (selected) and 'RECOMMENDATIONS'. Under 'TEST HISTORY', it says '4th Period'. Under 'RECOMMENDATIONS', there are two sections: 'NUMBERS & OPERATIONS' and 'ALGEBRAIC THINKING, PATTERNS & PROPORTIONAL REASONING'. Both sections list skills with corresponding Quantile Standard Codes (QSC).

| SKILLS AND CONCEPTS  | QSC        |
|--|------------|
| Represent division of whole numbers as a fraction in number and word problems.   | QSC-N-1024 |
| Represent division of fractions and mixed numbers with and without models and pictures in number and word problems; describe the inverse relationship between multiplication and division. | QSC-N-1028 |
| Compare and order rational numbers with and without models.  | QSC-N-260  |
| Represent multiplication or division of mixed numbers with and without models and pictures.  | QSC-N-1025 |
| Divide two fractions or a fraction and a whole number.   | QSC-N-230  |
| <b>ALGEBRAIC THINKING, PATTERNS &amp; PROPORTIONAL REASONING</b>   |            |
| Solve number and word problems using percent proportion, percent equation, or ratios.  | QSC-A-622  |
| Use the commutative, associative, and distributive properties, and inverses and identities to solve number and word problems with rational numbers.  | QSC-A-1039 |
| Calculate unit rates in number and word problems, including comparison of unit rates.  | QSC-A-233  |
| Identify relations as directly proportional, linear, or nonlinear using rules, tables, and graphs.   | QSC-A-567  |
| Calculate or estimate the percent of a number including discounts, taxes, and interest.  | QSC-A-264  |

## Understanding Recommendations

The instructional recommendations *are not* representative of items students answered correctly or incorrectly on the *Math Inventory* test. Each recommendation is a high-priority skill or concept from one of the three to five mathematical strands assessed in the student's grade and measured at a Quantile that is within the student's optimal instructional range.

# SAM Central | Student Analytics

Use the table of recommended skills and concepts in Student Analytics to differentiate and individualize instruction.

## ► USING INSTRUCTIONAL RECOMMENDATIONS

To view QSC details and plan instruction, enter the QSC ID number or Common Core State Standard from the student's recommendations into the Math Skills Database.

*How would you build individual recommendations into your instruction?*

### SEE ALSO

For more information on differentiating instruction with Quantile measures, see [pages 122–125](#).

## SAM Central | Leadership Dashboard

Administrators access the Leadership Dashboard on SAM Central to view high-level data snapshots and data analytics for the schools using *Math Inventory*. Click on any part of the visual to view a pop-up with performance-level information by school. Follow up with individual schools for appropriate intervention to increase student performance to proficiency.

Welcome, Maddy Hoffman | Friday, Feb. 28, 2019 | Notifications | Server Status | Log Out

### Leadership Dashboard

Powered by SAM

**ASSESSMENTS**

- The Math Inventory** (selected)
- The Reading Inventory

**LITERACY**

- READ180 Next Generation
- System 44 Next Generation
- iRead

**MATH**

- Math IS0 – Course 1
- FASTT Math

**REPORT SCHEDULER**

- Scheduled
- Saved
- Growth Summary Report

**View All** **Schedule a Report**

**GATEWAY**

- its
- eReads
- AB

**My District**

**The Math Inventory: Lincoln Unified School District**

**Filters**

**Current Performance Level**

19%  
8%  
54%  
19%

**Implementation Success Factors**

- Strategic Planning
- Upfront Training and Professional Development
- Ongoing Classroom Support
- Implementation Progress Monitoring
- Capacity Building Plan
- Technology Readiness

| School Name                | Student Enrollment | Avg Tests Taken | Tests < 15 min (%) | Avg First Test (Q) | Avg Last Test (Q) | Avg Growth |
|----------------------------|--------------------|-----------------|--------------------|--------------------|-------------------|------------|
| All Schools                | 2067               | 2               | 9%                 | 589                | 674               | 85         |
| Cesar Chavez Middle School | 87                 | 2               | 9%                 | 930                | 1005              | 111        |
| Hed Elementary School      | 257                | 1               | 7%                 | 650                | 755               | 208        |
| The Lincoln School         | 298                | 2               | 7%                 | 280                | 395               | 155        |
| Anthony A. Anderson School | 259                | 2               | 5%                 | 425                | 530               | 319        |

### Use the Leadership Dashboard to:

- View Performance Level and Growth data snapshots with pop-up information and a table of detailed data by school
- Filter school and district level data by demographics
- View resources for Implementation Success Factors
- Schedule and view reports

# SAM Central | Leadership Dashboard

The Leadership Dashboard also provides a data snapshot of average growth for all schools in the district between first and last test administration. Use the pop-ups from this snapshot and the table beneath to determine which schools in the district have made the most gains. Focus on schools making fewer gains to support instruction and improve growth at those schools.

Welcome, Maddy Hoffman | Friday, Feb. 28, 2019 | Notifications | Server Status | Log Out

## Leadership Dashboard

Powered by SAM

**ASSESSMENTS**

- The Math Inventory**
- The Reading Inventory**

**LITERACY**

- READ 180 Next Generation
- System 44 Next Generation
- iRead

**MATH**

- Math 180 – Course 1
- FASTT Math

**REPORT SCHEDULER**

- Scheduled
- Saved
- Growth Summary Report

**My District**

**The Math Inventory: Lincoln Unified School District**

**Average Growth**

Growth in Quantile: 85

QUANTILE

|            |     |     |     |     |     |     |     |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 0          | 100 | 200 | 300 | 400 | 500 | 600 | 700 |
| Last Test  |     |     |     |     |     |     | 674 |
| First Test |     |     |     |     |     |     | 589 |

Percentage with < 2 tests taken: 22%

**Implementation Success Factors**

- Strategic Planning
- Upfront Training and Professional Development
- Ongoing Classroom Support
- Implementation Progress Monitoring
- Capacity Building Plan
- Technology Readiness

Filters |

## ► REFLECT ON THE REPORT

How would you use the Leadership Dashboard to check that most students have taken *Math Inventory* the appropriate number of times in a given time period and to ensure that there is an assessment plan in place for students who have not taken *Math Inventory* the appropriate number of times?

## ► REFLECT ON THE DATA

How would you use the Leadership Dashboard to determine whether all schools and grades are making Quantile growth and to identify the grades and classes that need additional support?

## Data Reports | Overview

In addition to reporting students' *Math Inventory* measures in SAM Central's analytics, results are also organized into district, school, class, and individual data reports. *Math Inventory* reports serve specific purposes to meet the needs of teachers, students, families, and administrators. The chart below explains the five major purposes of the reports.

| Purpose                       | Audience   | Frequency  | Reports  |
|-------------------------------|--|--|--|
| <b>Growth</b>                 | Teachers and administrators can use these reports for ongoing growth monitoring. Teachers may share these reports with students, families, and administrators. | Generate these reports after two or more test administrations to monitor growth. Adjust time period settings, when available, to view customized data. | <ul style="list-style-type: none"> <li>· Progress to College and Career Report, <a href="#">p. 72</a></li> <li>· Growth Report, <a href="#">p. 78</a></li> <li>· Growth Summary Report, <a href="#">p. 82</a></li> </ul>                 |
| <b>Instructional Planning</b> | Teachers can use these reports to plan further instruction and intervention.   | Generate these reports after each <i>Math Inventory</i> test administration to inform grouping and instructional decisions.                            | <ul style="list-style-type: none"> <li>· Instructional Planning Report, <a href="#">p. 68</a></li> <li>· Progress to College and Career Report, <a href="#">p. 72</a></li> <li>· Student Test Printout, <a href="#">p. 76</a></li> </ul> |
| <b>Progress Monitoring</b>    | Administrators can use these reports to monitor progress.  | Generate these reports after each <i>Math Inventory</i> administration. Adjust time period setting, when available, to view customized data.           | <ul style="list-style-type: none"> <li>· Progress to College and Career Report, <a href="#">p. 72</a></li> <li>· Proficiency Summary Report, <a href="#">p. 80</a></li> </ul>  |
| <b>School-to-Home</b>         | Families will appreciate this report, which may be sent home or shared during conferences.   | Generate this report after each test administration or when planning conferences with parents or caregivers.   | <ul style="list-style-type: none"> <li>· School-to-Home Report, <a href="#">p. 88</a></li> </ul>   |
| <b>Management</b>             | Administrators and teachers can use these reports to track participation and usage.  | Generate these reports after each test administration.   | <ul style="list-style-type: none"> <li>· Test Activity Report, <a href="#">p. 84</a></li> <li>· Incomplete Test Report, <a href="#">p. 86</a></li> </ul>   |

# Choosing the Right Report

Use the tables below to determine which Teacher, Administrator, and Family reports to run in order to meet different data-sharing needs throughout the school year.

## Administrator Reports

| If You Want to ...   | Run This Report   |
|--|---|
| Analyze overall current math performance                                   | ➤ <b>Proficiency Summary Report</b> to identify the performance levels of all the students who have completed <i>Math Inventory</i> . ( <a href="#">p. 80</a> )   |
| Know how the district and school are using <i>Math Inventory</i>           | ➤ <b>Test Activity Report</b> to see the number of students enrolled in <i>Math Inventory</i> , how many tests students have taken, how many students have incomplete tests, and how many students have not been tested. ( <a href="#">p. 84</a> )                          |
| View a list of students who have not completed <i>Math Inventory</i> tests | ➤ <b>Incomplete Test Report</b> to identify students who did not complete the <i>Math Inventory</i> test on their latest attempt. It includes the Quantile measure of each student and the data of the incomplete test. ( <a href="#">p. 86</a> )                           |
| Evaluate students' Quantile growth over time                               | ➤ <b>Growth Summary Report</b> to view aggregated data on students' Quantile growth over time. It includes average Quantile growth between the first <i>Math Inventory</i> test administration and the last test, broken down by grade or school. ( <a href="#">p. 82</a> ) |

## Teacher Reports

| If You Want to ...   | Run This Report   |
|--|---|
| Identify students who may require intervention                               | ➤ <b>Instructional Planning Report</b> to group students into performance levels and target instruction for additional support. ( <a href="#">p. 68</a> )   |
| Evaluate a student's Quantile growth between two <i>Math Inventory</i> tests | ➤ <b>Growth Report</b> to show a student's Quantile measures and performance levels for each test. ( <a href="#">p. 78</a> )  |
| Review a student's test history and instructional recommendations            | ➤ <b>Progress to College and Career Report</b> to view the student's Fact Screener results, Quantile measures on all <i>Math Inventory</i> tests taken during the selected time period, performance levels, and normative data. Instructional recommendations organized by strand and aligned to Common Core State Standards are also provided. ( <a href="#">p. 72</a> ) |
| Review a student's complete printout of <i>Math Inventory</i> test           | ➤ <b>Student Test Printout</b> to see a student's Fact Screener results and each <i>Math Inventory</i> test item with the student's answer and the correct answer both indicated. ( <a href="#">p. 76</a> )   |

## Family Reports

| If You Want to ...  | Run This Report  |
|---|--|
| Communicate with parents or caregivers about <i>Math Inventory</i> test results | ➤ <b>School-to-Home Report</b> to share test dates, Quantile measures, and performance levels for individual students. This report is also available in Spanish. ( <a href="#">p. 88</a> ) |

## Instructional Planning Report

### Purpose

This report groups students into performance levels and targets additional support for students across all performance levels. This report is organized specifically for grouping and intervention needs.

### Instructional Planning Report

Class: 3rd Period

School: Williams Middle School  
Teacher: Sarah Foster  
Grade: 5

1 Time Period: 12/13/18–02/22/19

| 2 PERFORMANCE LEVEL | STUDENTS            | GRADE | SCREENER |       | QUANTILE® MEASURE | DATE     | TEST TIME (MIN) | NORMATIVE DATA  |     |         |
|---------------------|---------------------|-------|----------|-------|-------------------|----------|-----------------|-----------------|-----|---------|
|                     |                     |       | ADDITION | MULTI |                   |          |                 | PERCENTILE RANK | NCE | STANINE |
| A                   | Gainer, Jacquelyn   | 5     | ●        | ●     | 906Q              | 02/22/19 | 35              | 95              | 85  | 8       |
| A                   | Cho, Henry          | 5     | ●        | ●     | 897Q              | 02/22/19 | 25              | 94              | 83  | 8       |
| A                   | ► Collins, Chris    | 5     | ●        | ●     | 853Q              | 02/22/19 | 12              | 90              | 77  | 8       |
| P                   | Kohlmeier, Ryan     | 5     | ●        | ◐     | 772Q              | 02/22/19 | 40              | 73              | 63  | 6       |
| P                   | Cooper, Maya        | 5     | ●        | ●     | 772Q              | 02/22/19 | 37              | 73              | 63  | 6       |
| P                   | Enoki, Jeanette     | 5     | ●        | ●     | 766Q              | 02/22/19 | 39              | 71              | 62  | 6       |
| B                   | Hartsock, Shalanda  | 5     | ●        | ●     | 760Q              | 02/22/19 | 33              | 69              | 60  | 6       |
| B                   | Terrell, Walt       | 5     | ●        | ●     | 679Q              | 02/22/19 | 26              | 45              | 47  | 5       |
| B                   | Cocanower, Jaime    | 5     | ●        | ●     | 675Q              | 02/22/19 | 38              | 43              | 46  | 5       |
| B                   | Garcia, Matt        | 5     | ●        | ◐     | 663Q              | 02/22/19 | 15              | 41              | 45  | 5       |
| B                   | Dixon, Ken          | 5     | ●        | ◐     | 656Q              | 02/22/19 | 35              | 39              | 44  | 4       |
| B                   | Morris, Timothy     | 5     | ●        | ◐     | 638Q              | 02/22/19 | 30              | 35              | 42  | 4       |
| B                   | ► Blume, Joy        | 5     | ●        | ◐     | 630Q              | 02/22/19 | 9               | 33              | 41  | 4       |
| BB                  | Ramirez, Jeremy     | 5     | ●        | ●     | 602Q              | 02/22/19 | 37              | 28              | 38  | 4       |
| BB                  | ► Robinson, Tiffany | 5     | ◐        | ◐     | 577Q              | 02/22/19 | 9               | 24              | 35  | 4       |
| BB                  | Williams, Anthony   | 5     | ◐        | ◐     | 413Q              | 02/22/19 | 35              | 6               | 17  | 2       |

**KEY**

- EM Emerging Mathematician
- A ADVANCED
- P PROFICIENT
- B BASIC
- BB BELOW BASIC
- I INCOMPLETE TESTS

- Test taken in less than 15 minutes
- ◐ Student may need to develop this skill
- Student has acquired this skill

| YEAR-END PROFICIENCY RANGES |                    |                     |
|-----------------------------|--------------------|---------------------|
| GRADE K 9–117Q              | GRADE 5 645–771Q   | GRADE 9 1133–1214Q  |
| GRADE 1 117–232Q            | GRADE 6 785–890Q   | GRADE 10 1216–1248Q |
| GRADE 2 271–382Q            | GRADE 7 881–970Q   | GRADE 11 1216–1248Q |
| GRADE 3 381–545Q            | GRADE 8 1001–1089Q | GRADE 12 1216–1248Q |
| GRADE 4 534–629Q            |                    |                     |

**USING THE DATA**

**Purpose:**  
This report provides instructional recommendations for students at each Math Inventory performance level.

**Follow-Up:**  
Use instructional recommendations to plan appropriate support for students at each level.

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Page 1 of 5

Printed on: 2/22/2019

# Instructional Planning Report

## Use the Data

- Who:** Teachers, Administrators (Grade, Class, or Group report)
- When:** After each *Math Inventory* test administration, or according to the instructional needs of the individual teacher
- How:** View the students in each performance-level group and plan instruction and intervention to match the group's Quantile measure range using the instructional recommendations provided.

### SEE ALSO

See [page 120](#) for more information on using Quantile measures to plan instruction.

## Understand the Data

- ❶ **Header:** The grades, class, or group is listed at the top of the report, followed by related school information and the time period covered by the report.
- ❷ **Performance Level:** This column shows the student's math achievement level, based on *Math Inventory* performance levels: Advanced, Proficient, Basic, and Below Basic. If an administrator modifies the levels, those changes will appear in this report.
- ❸ **Screener:** Addition Fact Screener and Multiplication Fact Screener results are shown for each student. The key for the screeners, is as follows:
  - Indicates possible need for work on math facts
  - Indicates that the student passed tested facts
- ❹ **Quantile/Date:** Student's Quantile measure and date of last test are shown.
- ❺ **Normative Data:** Percentile rank, normal curve equivalent (NCE), and stanine are shown for each student based on national data.

## Data in Action

Use this report to help you group and plan for differentiated instruction. Students in the Advanced performance level are ready for instruction above grade level, Proficient students are ready for grade-level core instruction, those in the Basic performance-level group are one year below grade level, and those in the Below Basic are two or more years below grade level.

# Instructional Planning Report

## Purpose

Additional pages of the Instructional Planning Report provide charts of students who need to focus on fact fluency and targeted recommendations focused on grade-level priorities for students in each of the four performance levels.



**INSTRUCTIONAL PLANNING**

### Instructional Planning Report

Class: 3rd Period

School: Williams Middle School  
Teacher: Sarah Foster  
Grade: 5

Time Period: 12/13/18–02/22/19



**Math Inventory**

---

#### INSTRUCTIONAL RECOMMENDATIONS

1

**Focus on Fact Fluency**

The Math Inventory Screener indicates that the students below may need to work on quick retrieval of math facts.

| ADDITION          | MULTIPLICATION  |
|-------------------|-----------------|
| Robinson, Tiffany | Kohlmeier, Ryan |
| Williams, Anthony | Garcia, Matt    |
| Dixon, Ken        |                 |
| Morris, Timothy   |                 |
| Blume, Joy        |                 |
| Robinson, Tiffany |                 |
| Williams, Anthony |                 |

2

**Focus on Priority Skills and Concepts**

The tables below indicate skills and concepts that students at each performance level are ready to learn. Each recommended skill or concept aligns to a QSC (Quantile Skill and Concept) within the Quantile Framework, as well as to one or more Common Core State Standards. Use the Math Skills Database, available through SAM Central or at [www.quantiles.com](http://www.quantiles.com), to access instructional resources aligned to each QSC.

**Performance Level: Advanced**

| STUDENT           | QUANTILE® MEASURE |
|-------------------|-------------------|
| Gainer, Jacquelyn | 906Q              |
| Cho, Henry        | 897Q              |
| Collins, C        | 890Q              |

3

| SKILLS AND CONCEPTS  | QSC ID  | COMMON CORE STATE STANDARD ID |
|--|---------|-------------------------------|
| NUMBERS AND OPERATIONS   |         |                               |
| Determine the absolute value of a number with and without models in number and word problems.  | QSC636  | 6.NS.C.7c                     |
| Represent division of fractions and mixed numbers with and without models and pictures in number and word problems; describe the inverse relationship between multiplication and division. | QSC1028 | 6.NS.A.1                      |
| Contrast statements about absolute values of integers with statements about integer order.   | QSC1030 | 6.NS.C.7d                     |

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# Instructional Planning Report

## Understand the Data

- ❶ **Focus on Fact Fluency:** Quickly see which students may need to work on quick fact retrieval in each operation.
- ❷ **Skills and Concepts:** Target instruction for each performance-level group by focusing on the skills and concepts most crucial to algebra readiness for the Quantile range of the group.
- ❸ **Common Core State Standard ID:** Plan instruction by connecting recommended skills and concepts to Common Core State Standards.

### ► ANALYZE THE REPORT

Write down how you would use this report to group and plan for instruction on a specified skill or concept.

# Progress to College and Career Report

## Purpose

This report shows a student's *Math Inventory* performance history. It provides instructional recommendations based on the Quantile measure from the last test in a time period.



**GROWTH**

### Progress to College and Career Report

**STUDENT:** Collins, Chris

**School:** Williams Middle School  
**Teacher:** Sarah Foster  
**Grade:** 5  
**Class:** 3rd Period  
**Group:** Group A

**Time Period:** 08/24/18 – 02/22/19



|                  |              | <b>SCREENER</b> |              | <b>QUANTILE® MEASURE</b> | <b>PERFORMANCE LEVEL</b> | <b>PERCENTILE RANK</b> |
|------------------|--------------|-----------------|--------------|--------------------------|--------------------------|------------------------|
| <b>TEST DATE</b> | <b>GRADE</b> | <b>ADDITION</b> | <b>MULTI</b> |                          |                          |                        |
| 02/22/2019       | 5            | ●               | ●            | 853Q                     | A                        | 90                     |
| 12/13/2018       | 5            | ●               | ●            | 766Q                     | P                        | 71                     |
| ► 03/04/2019     | 5            | ●               | ●            | 684Q                     | B                        | 46                     |

**KEY**

- EM** Emerging Mathematician
- A** ADVANCED
- P** PROFICIENT
- B** BASIC
- BB** BELOW BASIC
- IT** INCOMPLETE TESTS
- Test taken in less than 15 minutes
- Student may need to develop this skill
- Student has acquired this skill

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# Progress to College and Career Report

## Use the Data

Who: Teachers

When: After each *Math Inventory* administration, usually 3–5 times per year

How: Monitor the individual student's growth along the trajectory to algebra and college and career readiness. Use the instructional recommendations to plan instruction that helps the student meet grade-level benchmarks.

## Understand the Data

- ① **Header:** The student's name is listed at the top of the report, followed by related school information and the time period covered by the report.
- ② **Test Date and Grade:** View longitudinal test history data across grades.
- ③ **Screener:** Observe when students passed each portion of the screener and changes in performance from one school year to the next.
- ④ **Quantile Measure and Performance Level:** Monitor Quantile measure and related performance-level growth.
- ⑤ **Percentile Rank:** Use percentile rank to compare a student's performance to that of peers in the same grade.

## Data in Action

Use this report to share information with individual students, noting changes in performance from test to test. Investigate any significant decline in progress and set growth goals. For instructional planning, utilize information provided in Instructional Recommendations ([page 74](#)).

### SEE ALSO

See [page 125](#) for more information on providing individualized support.

### TIP

About 1 percent of students will score at the lowest or highest possible score for the grade, test after test. This means the student is likely scoring outside the lowest obtainable scale score (LOSS) or highest obtainable scale score (HOSS) for the grade. If this occurs, incorporate additional assessment data to fine-tune the student's learning readiness. See [page 48](#) for a chart of performance levels by grade and more detail about LOSS and HOSS.

# Progress to College and Career Report

## Purpose

The last pages of the report provide instructional recommendations aligned to the Common Core State Standards that are grade-level priorities within the instructional range of the student's Quantile measure.



**GROWTH**

**Progress to College and Career Report**

**STUDENT:** Collins, Chris

**SCHOOL:** Williams Middle School  
**TEACHER:** Sarah Foster  
**GRADE:** 5  
**CLASS:** 3rd Period  
**GROUP:** Group A

**Time Period:** 08/24/18 – 02/22/19



**Math Inventory**

---

**INSTRUCTIONAL RECOMMENDATIONS FOR CHRIS**

**Focus on Fact Fluency**  
 The Math Inventory Screener indicates that Chris may need to work on quick retrieval of multiplication facts.

**Focus on Priority Skills and Concepts**  
 For a student with a Quantile® measure of 890Q, focus on the skills and concepts indicated below. Each recommended skill or concept aligns to a QSC (Quantile Skill and Concept) within the Quantile Framework, as well as to one or more Common Core State Standards. Use the Math Skills Database, available through SAM Central or at [www.quantiles.com](http://www.quantiles.com), to access instructional resources aligned to each QSC.

| SKILLS AND CONCEPTS   | QSC ID | COMMON CORE STATE STANDARD ID  |
|---|--------|--------------------------------|
| <b>NUMBERS &amp; OPERATIONS</b>   |        |                                |
| Multiply or divide with mixed numbers in number and word problems.  | QSC609 | 5.NF.B.6                       |
| Determine the absolute value of a number with and without models in number and word problems.   | QSC636 | 6.NS.C.7c                      |
| <b>ALGEBRAIC THINKING, PATTERNS, AND PROPORTIONAL REASONING</b>   |        |                                |
| Describe the effect of operations on size and order of numbers.   | QSC168 | 5.OA.A.2, 5.NF.B.5a, 5.NF.B.5b |
| Find multiples, common multiples, and the least common multiple of numbers; explain.  | QSC221 | 6.NS.B.4                       |
| <b>GEOMETRY, MEASUREMENT, AND DATA</b>  |        |                                |
| Convert measures of length, area, capacity, weight, and time expressed in a given unit to other units in the same measurement system in number and word problems.             | QSC258 | 5.MD.A.1                       |
| Use models to find volume for prisms and cylinders as the product of the area of the base ( $B$ ) and the height. Calculate the volume of prisms in number and word problems. | QSC289 | 5.MD.C.5a, 5.MD.C.5b           |

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# Progress to College and Career Report

## ► REFLECT ON DATA

Use **pages 72–74** to determine the following:

- **Report Data**

What data from this report would you find most useful and why?

- **Maintaining Trajectory**

How does viewing the student's trajectory toward grade-level benchmarks and college and career readiness assist with instruction? What can you do to continue to accelerate a student's trajectory toward college and career readiness?

- **Instructional Goals**

How would you use this report to set goals for the end of the school year?

How would you use the recommendations from this report and the Quantile resources to help the student achieve these goals?

## Reflecting on the Progress to College and Career Report

How would you use this report to target instruction and accelerate student growth?

### REPORT DATA

### MAINTAINING TRAJECTORY

### INSTRUCTIONAL GOALS

## Student Test Printout

### Purpose

This report provides a complete printout of the last *Math Inventory* test the individual student completed in a selected time period. The printout includes each test item with both the student's answer and the correct answer indicated, as well as item duration and test duration.

**Student Test Printout**

Student: Cooper, Maya

INSTRUCTIONAL PLANNING

Class: 3rd period  
Teacher: Sarah Foster  
Grade: 5

Time Period: 08/24/18–02/02/19  
Test Date: 1/25/2019  
Number of Items: 30  
Test Time: 21 Minutes  
Student Quantile® Measure: 681Q

| MATH FACT SCREENER |       |
|--------------------|-------|
| ADDITION           | MULTI |
| ●                  | ●     |



**KEY**

- Student may need to develop this skill
- Student has acquired this skill

**Student Test Printout**

Student: Cooper, Maya

INSTRUCTIONAL PLANNING

Class: 3rd period  
Teacher: Sarah Foster  
Grade: 5

**Purpose:**  
This report details the items administered to a student during their most recent *Math Inventory* test, completed in the selected time period.

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Item 1: Luis has  $\frac{1}{3}$  of a yard of fabric that he needs to cut into 4 equally-sized strips. How much fabric can Luis cut for each strip?  
 A)  $4\frac{1}{3}$  yd  
 B)  $1\frac{1}{3}$  yd  
 C)  $\frac{3}{4}$  yd  
 D)  $\frac{1}{12}$  yd

Correct Answer: D      Student Answer: B      Response Time: 10 sec

# Student Test Printout

## Use the Data

Who: Teachers

When: After each *Math Inventory* administration, usually 3–5 times per year

How: Conference with students to discuss item and test duration as well as specific item responses. Identify areas of instruction in which the student may need additional support, and determine whether the student put forth best efforts or may need to retake the assessment.

### SEE ALSO

See [page 136](#) for more information on using data to conference with students.

## Understand the Data

- ① **Header:** The student's name is listed at the top of the report, followed by related school information and the time period covered by the report.
- ② **Test Overview:** The date of the test, length of the test in minutes, number of items, and Quantile measure are shown.
- ③ **Math Fact Screener:** Addition and Multiplication Fact Screener results are shown for the last completed *Math Inventory* test in the selected time period.
- ④ **Response Time:** Look in this area for how long it took the student to answer the item. This information can be used to determine whether items were thoughtfully considered or whether answer choices may have been rushed.
- ⑤ **Test Questions:** The full content of each question is provided, including the question or problem, the answer choices, the correct answer, and the student's answer.

### TIP

#### Time Period Settings

This report will generate for the student's most recent *Math Inventory* assessment. Adjust the time period when generating the report in order to review and discuss previous tests with the student.

### TIP

About 1 percent of students will score at the lowest or highest possible score for the grade, test after test. This means the student is likely scoring outside the lowest obtainable scale score (LOSS) or highest obtainable scale score (HOSS) for the grade. If this occurs, incorporate additional assessment data to fine-tune the student's learning readiness. See [page 48](#) for a chart of performance levels by grade and more detail about LOSS and HOSS.

## Data in Action

Use this report to help you conference with students and provide individualized instruction. Review the test items the student or a small group of students answered incorrectly, and provide instruction and practice on the skill or concepts the items assessed.

## Growth Report

### Purpose

This report measures students' Quantile measure growth between two *Math Inventory* tests in a selected time period. This helps teachers track their classes and students' *Math Inventory* test scores and growth between test administrations.



**Growth Report**  
CLASS: 3rd Period

School: Lincoln Middle School  
Teacher: Sarah Foster  
Grade: 5  
Time Period: 12/13/18–02/22/19



1
2
3
4

| STUDENT            | GRADE | FIRST TEST |                                      | LAST TEST  |                                      | GROWTH IN QUANTILE® MEASURE |
|--------------------|-------|------------|--------------------------------------|------------|--------------------------------------|-----------------------------|
|                    |       | DATE       | QUANTILE® MEASURE/ PERFORMANCE LEVEL | DATE       | QUANTILE® MEASURE/ PERFORMANCE LEVEL |                             |
| Gainer, Jacquelyn  | 5     | 12/13/18   | 873Q A                               | 02/22/19   | 1045Q A                              | 172Q [Bar]                  |
| Cho, Henry         | 5     | 12/13/18   | 889Q A                               | 02/22/19   | 1045Q A                              | 156Q [Bar]                  |
| Collins, Chris     | 5     | 12/13/18   | 749Q P                               | 02/22/19   | 889Q A                               | 140Q [Bar]                  |
| Cooper, Maya       | 5     | 12/13/18   | 699Q B                               | 02/22/19   | 821Q A                               | 122Q [Bar]                  |
| Robinson, Tiffany  | 5     | 12/13/18   | 393Q BB                              | 02/22/19   | 485Q BB                              | 92Q [Bar]                   |
| Cocanower, Jaime   | 5     | 12/13/18   | 540Q B                               | ► 02/22/19 | 608Q B                               | 68Q [Bar]                   |
| Enoki, Jeanette    | 5     | 12/13/18   | 649Q P                               | 02/22/19   | 705Q P                               | 56Q [Bar]                   |
| Terrell, Walt      | 5     | 12/13/18   | 572Q B                               | 02/22/19   | 620Q B                               | 48Q [Bar]                   |
| Hartsock, Shalanda | 5     | 12/13/18   | 595Q B                               | 02/22/19   | 642Q B                               | 47Q [Bar]                   |
| Garcia, Matt       | 5     | ► 12/13/18 | 540Q B                               | 02/22/19   | 583Q B                               | 43Q [Bar]                   |
| Morris, Timothy    | 5     | 12/13/18   | 522Q BB                              | 02/22/19   | 553Q B                               | 31Q [Bar]                   |
| Ramirez, Jeremy    | 5     | ► 12/13/18 | 481Q BB                              | 02/22/19   | 500Q BB                              | 19Q [Bar]                   |

**KEY**

EM Emerging Mathematician

- ADVANCED
- PROFICIENT
- BASIC
- BELOW BASIC
- Test taken in less than 15 minutes

| YEAR-END PROFICIENCY RANGES |          |                     |
|-----------------------------|----------|---------------------|
| GRADE K                     | 9–117Q   | GRADE 5 645–771Q    |
| GRADE 1                     | 117–232Q | GRADE 6 785–890Q    |
| GRADE 2                     | 271–382Q | GRADE 7 881–970Q    |
| GRADE 3                     | 381–545Q | GRADE 8 1001–1089Q  |
| GRADE 4                     | 534–629Q | GRADE 9 1133–1214Q  |
|                             |          | GRADE 10 1216–1248Q |
|                             |          | GRADE 11 1216–1248Q |
|                             |          | GRADE 12 1216–1248Q |

| USING THE DATA   |   |
|--|---|
| <p><b>Purpose:</b><br/>This report shows changes in student performance and growth on <i>Math Inventory</i> over time.</p> | <p><b>Follow-Up:</b><br/>Provide opportunities to challenge students who show significant growth. Provide targeted intervention and support to students who show little growth.</p> |

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Performance Bands Applied: EOY

# Growth Report

## Use the Data

- Who:** Teachers and Administrators (Teacher, Class, or Group cohort)
- When:** Run this report every 8–12 weeks and whenever a majority of students in a class or group have completed at least two *Math Inventory* test administrations.
- How:** Identify students making limited growth in Quantile measures between assessments, and target instruction to increase gains.

## Understand the Data

- ❶ **Header:** The grade, teacher, class, or group is listed at the top of the report, followed by related school information and the time period covered by the report.
- ❷ **First Test in Selected Time Period:** Test Date, Performance Level, and Quantile measure are shown for the first *Math Inventory* test in the selected time period.
- ❸ **Last Test in Selected Time Period:** Test Date, Performance Level, and Quantile measure are shown for the last *Math Inventory* test in the selected time period.
- ❹ **Actual Growth in Quantile Measure:** This column shows an increase in Quantile measure between the first and last tests in the selected time period.

### → TIP

About 1 percent of students will score at the lowest or highest possible score for the grade, test after test. This means the student is likely scoring outside the lowest obtainable scale score (LOSS) or highest obtainable scale score (HOSS) for the grade. If this occurs, incorporate additional assessment data to fine-tune the student's learning readiness. See [page 48](#) for a chart of performance levels by grade and more detail about LOSS and HOSS.

## Data in Action

Use this report to compare any two test dates. The report is based on the first and last *Math Inventory* tests taken during the chosen time period. Make sure the time period setting you choose covers at least two *Math Inventory* tests. You may wish to run separate reports isolating the different dates. The default period is **This School Year**. Grading periods and custom settings are also available.

# Proficiency Summary Report

## Purpose

This report shows the math performance of students within a district, school, or grade, or for an individual teacher, class, or group.



**Proficiency Summary Report**  
SCHOOL: ZOOLANDER  
Time Period: 09/01/16 – 07/31/19

Total Students: 11



|            |                    |                   |
|------------|--------------------|-------------------|
| <b>27%</b> | <b>Advanced</b>    | <b>3 students</b> |
| <b>55%</b> | <b>Below Basic</b> | <b>6 students</b> |
| <b>9%</b>  | <b>Proficient</b>  | <b>1 students</b> |
| <b>9%</b>  | <b>Basic</b>       | <b>1 students</b> |

1
2
3

**KEY**

- Advanced 27%, 3 students
- Proficient 9%, 1 student
- Basic 9%, 1 student
- Below Basic 55%, 6 students

**YEAR-END PROFICIENCY RANGES**

|                  |                    |                     |
|------------------|--------------------|---------------------|
| Grade K 9-117Q   | Grade 5 645-771Q   | Grade 10 1216-1248Q |
| Grade 1 117-232Q | Grade 6 785-890Q   | Grade 11 1216-1248Q |
| Grade 2 271-382Q | Grade 7 881-970Q   | Grade 12 1216-1248Q |
| Grade 3 381-545Q | Grade 8 1001-1089Q |                     |
| Grade 4 534-629Q | Grade 9 1133-1214Q |                     |

**USING THE DATA**

|  |  |
|--|--|
| <b>Purpose:</b><br>This report shows the math performance of students within a district, school, grade, or for an individual teacher, class, or group. | <b>Follow-Up:</b><br>Identify districts or schools that are not showing adequate growth over time. Contact principals or other administrators to discuss strategies for maximizing the performance of students in their schools. |
|--|--|

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v 1.1  
Performance Bands Applied: Fixed-EOY

# Proficiency Summary Report

## Use the Data

**Who:** District and School Administrators and Teachers

**When:** After each *Math Inventory* administration

**How:** Use this report to gain a high-level overview of *Math Inventory* results within a district, school, or grade, or for an individual class, teacher, or group.

### SEE ALSO

Districts can customize how to report student performance on *Math Inventory*. See [page 95](#) for instructions on changing the district's reporting setting.

## Understand the Data

- ① Header:** The district, school, grade, class, teacher, or group is listed at the top of the report, followed by the total number of students who have completed at least one *Math Inventory* assessment within the selected time period.
- ② Performance Level:** The circle graph is divided among the four *Math Inventory* assessment performance levels: Advanced, Proficient, Basic, and Below Basic. The total number of students and percentage of students in each performance level are listed.
- ③ Year-End Proficiency Ranges:** Ranges within which students are considered to be proficient for their grade level. The chart will list end-of-year proficiency goals. Grades included in the data are highlighted.

### TIP

About 1 percent of students will score at the lowest or highest possible score for the grade, test after test. This means the student is likely scoring outside the lowest obtainable scale score (LOSS) or highest obtainable scale score (HOSS) for the grade. If this occurs, incorporate additional assessment data to fine-tune the student's learning readiness. See [page 48](#) for a chart of performance levels by grade and more detail about LOSS and HOSS.

## ► USING THE DATA

How can you use the data in this report to structure your intervention resources for teachers, grades, schools, or the entire district?

## Growth Summary Report

### Purpose

This report measures Quantile growth over time, between two *Math Inventory* test dates in a selected time period, by district broken down by school, and by school broken down by grade and teacher/class.



**GROWTH**

### Growth Summary Report

DISTRICT: Eastern Regional District

Time Period: 11/12/18–02/22/19

Total Schools: 14

Total Students: 126

Average Quantile® Growth: 146



**Math Inventory**

2
1
3
4

**2** Eastern Regional District (126 total students)

| SCHOOL                 | FIRST TEST SCORE (AVG.) IN SELECTED TIME PERIOD | LAST TEST SCORE (AVG.) IN SELECTED TIME PERIOD | AVERAGE GROWTH IN QUANTILE® MEASURE |
|------------------------|---|--|-------------------------------------|
| Lincoln High           | 1165Q   | 1170Q  | 5Q                                  |
| Crane Elementary       | 160Q  | 220Q   | 60Q                                 |
| Williams Middle School | 964Q  | 1224Q  | 260Q                                |
| Landford Institute     | 326Q  | 345Q   | 19Q                                 |
| Hingham HS             | 695Q  | 760Q   | 65Q                                 |
| Trotier Middle Schools | 625Q  | 905Q   | 280Q                                |
| Cozy Lake Elementary   | EM  | 270Q   | 270Q                                |

**Landford Institute (15 total students)**

| SCHOOL         | FIRST TEST SCORE (AVG.) IN SELECTED TIME PERIOD | LAST TEST SCORE (AVG.) IN SELECTED TIME PERIOD | AVERAGE GROWTH IN QUANTILE® MEASURE |
|----------------|---|--|-------------------------------------|
| Kindergarten   | 155Q  | 205Q   | 50Q                                 |
| First grade    | 715Q  | 340Q   | 65Q                                 |
| Second grade   | 457Q  | 505Q   | 48Q                                 |
| Third grade    | 635Q  | 750Q   | 115Q                                |
| Fourth grade   | 715Q  | 795Q   | 80Q                                 |
| Fifth grade    | 855Q  | 920Q   | 65Q                                 |
| Sixth grade    | 905Q  | 980Q   | 75Q                                 |
| Seventh grade  | 925Q  | 990Q   | 65Q                                 |
| Eighth grade   | 1005Q   | 1065Q  | 60Q                                 |
| Ninth grade    | 1155Q   | 1180Q  | 25Q                                 |
| Tenth grade    | 1235Q   | 1295Q  | 60Q                                 |
| Eleventh grade | 1360Q   | 1400Q  | 40Q                                 |
| Twelfth grade  | 1375Q   | 1445Q  | 70Q                                 |

**KEY**

EM Emerging Mathematician

**USING THE DATA**

|  |  |
|--|--|
| <p><b>Purpose:</b><br/>This report shows average student growth over time at the district or school level.</p> | <p><b>Follow-Up:</b><br/>Identify groups that are not showing adequate growth and may require additional support or resources.</p> |
|--|--|

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# Growth Summary Report

## Use the Data

**Who:** Administrators (School, or District cohort)

**When:** Generate after the school or district has completed at least two *Math Inventory* test administrations

**How:** Identify schools, or individual grades or classes within a school, that are not showing adequate growth over time, and provide extra help to optimize *Math Inventory* performance.

## Understand the Data

- ① **Header:** The district or school is listed at the top of the report, followed by the time period covered by the report; the total number of schools, grades, or classes enrolled in *Math Inventory*; the total number of students enrolled in *Math Inventory*; and the average student Quantile growth of all students enrolled in *Math Inventory*.
- ② **School etc.:** The school, class, or grade that the data is broken down to.
- ③ **First/Last Test Score:** The average of students' first and last test scores in the selected time period for the specified school, class, or grade.
- ④ **Average Growth in Quantile Measure:** The average growth in Quantile measures for the school, class, or grade, accompanied by a bar measuring average comparative growth between schools, classes, or grades.

## Test Activity Report

### Purpose

This report provides data on how each school, grade, or teacher in a district is using *Math Inventory*.



**MANAGEMENT**

### Test Activity Report

CLASS: 3rd Period

**1**

School: Lincoln Middle School  
 Teacher: Sarah Foster  
 Grade: 5  
 Time Period: 08/24/18–02/02/19



**Math  
Inventory**

| TEACHER           | STUDENTS ENROLLED | STUDENTS TESTED ONCE |             | STUDENTS TESTED TWICE |             | STUDENTS TESTED THREE OR MORE TIMES |              | STUDENTS WITH NO COMPLETED TESTS |             | STUDENTS NOT TESTED |             |
|-------------------|-------------------|----------------------|-------------|-----------------------|-------------|-------------------------------------|--------------|----------------------------------|-------------|---------------------|-------------|
| Sarah Foster      | 33                | 6%                   | (2)         | 21%                   | (7)         | 18%                                 | (6)          | 0%                               | (0)         | 55%                 | (18)        |
| Margaret Schimmer | 36                | 0%                   | (0)         | 50%                   | (18)        | 0%                                  | (0)          | 0%                               | (0)         | 50%                 | (18)        |
| Elaine Kravitz    | 24                | 70%                  | (2)         | 10%                   | (2)         | 50%                                 | (12)         | 0%                               | (0)         | 30%                 | (8)         |
| Patrice Hammond   | 15                | 20%                  | (3)         | 0%                    | (0)         | 0%                                  | (0)          | 0%                               | (0)         | 80%                 | (12)        |
| Bill Dahberg      | 20                | 25%                  | (5)         | 0%                    | (0)         | 50%                                 | (10)         | 25%                              | (5)         | 0%                  | (0)         |
| Juan Velasco      | 36                | 10%                  | (3)         | 10%                   | (3)         | 80%                                 | (30)         | 0%                               | (0)         | 0%                  | (0)         |
| Malgari Thomas    | 32                | 50%                  | (16)        | 0%                    | (0)         | 0%                                  | (0)          | 0%                               | (0)         | 50%                 | (16)        |
| Elizabeth Bentley | 32                | 0%                   | (0)         | 25%                   | (8)         | 50%                                 | (16)         | 13%                              | (5)         | 12%                 | (3)         |
| Terell Bromberg   | 34                | 0%                   | (0)         | 0%                    | (0)         | 100%                                | (34)         | 0%                               | (0)         | 0%                  | (0)         |
| <b>TOTAL</b>      | <b>262</b>        | <b>12%</b>           | <b>(31)</b> | <b>15%</b>            | <b>(38)</b> | <b>39%</b>                          | <b>(108)</b> | <b>4%</b>                        | <b>(10)</b> | <b>29%</b>          | <b>(75)</b> |

**USING THE DATA**

|  |   |
|--|---|
| <p><b>Purpose:</b><br/>                 This report details <i>Math Inventory</i> usage at the district or school level.</p> | <p><b>Follow-Up:</b><br/>                 Review usage with school leaders or teachers who are not administering <i>Math Inventory</i> as expected.</p> |
|--|---|

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# Test Activity Report

## Use the Data

- Who:** Administrators (School, or District cohort)
- When:** Generate after *Math Inventory* test administration window for the school or district
- How:** View data on how many students at each school are enrolled in *Math Inventory* as well as how many students (by percentage and number) have taken *Math Inventory* tests once, twice, or three or more times. Note the percentage and number of students per school, grade, or class who have no complete tests or have not been tested.

## Understand the Data

- ① Header:** The district, school, and teacher are listed at the top of the report, followed by the time period covered by the report.
- ② Students Enrolled:** This column shows the total number of students per school, grade, teacher, or class who are enrolled in *Math Inventory*.
- ③ Students Tested:** The percentage and number of students tested once, twice, or three or more times are shown. The total number of students is also shown.
- ④ Students with No Completed Tests:** The percentage and number of students who began but did not complete tests is shown. These students have incomplete test records.
- ⑤ Students Not Tested:** The percentage and number of students enrolled in *Math Inventory* but who did not take a test is shown.

## Data in Action

Use this report to identify schools, grades, or classes with students who are missing *Math Inventory* tests and to support principals and teachers who need to schedule 35-minute blocks for testing.

## Incomplete Test Report

### Purpose

This report shows students who did not complete the *Math Inventory* test on their latest attempt. It includes the Quantile measure of each student and the date of the incomplete test.

 MANAGEMENT

### Incomplete Test Report

Class: 3rd Period

School: Lincoln Middle School

Teacher: Sarah Foster

Grade: 5

Time Period: 12/13/18–02/22/19

**1**

**2**

|                    |                      | LAST COMPLETE TEST |          |
|--------------------|----------------------|--------------------|----------|
| STUDENTS           | INCOMPLETE TEST DATE | QUANTILE® MEASURE  | DAY      |
| Peterson, Peter    | 02/22/19             | N/A                | N/A      |
| Pierce, Lori       | 02/22/19             | EM                 | 12/13/18 |
| Ramirez, Gabriella | 02/22/19             | 675Q               | 12/13/18 |

**3**

**KEY**

EM Emerging Mathematician

**USING THE DATA**

|  |   |
|--|---|
| <b>Purpose:</b><br>This report shows students who have not completed their most recent <i>Math Inventory</i> test. | <b>Follow-Up:</b><br>Schedule time for each student to complete the test. |
|--|---|

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Printed on: 2/22/2019

# Incomplete Test Report

## Use the Data

**Who:** Teachers (Teacher, Class, or Group cohort)

**When:** After each *Math Inventory* test administration

**How:** Identify students who did not complete the *Math Inventory* test on their latest attempt and the date of the incomplete test. Schedule students to complete the test within two weeks or delete incomplete tests in SAM Central Settings.

### SEE ALSO

See [page 104](#) for more information on how to delete incomplete tests in SAM Central.

## Understand the Data

- ① Header:** The teacher, class, or group is listed at the top of the report, followed by related school information and the time period covered by the report.
- ② Incomplete Test Date:** The date of each student's incomplete test is shown.
- ③ Last Complete Test:** The Quantile measure and the date of each student's last complete *Math Inventory* test are shown.

## Data in Action

Use this report to manage the *Math Inventory* make-up-test schedule according to the date of student's last incomplete test. Tests must be completed within two weeks of start date. This report can also be used to identify incomplete tests for deletion. Students will then be able to begin a new test on next logon.

## School-to-Home Report

### Purpose

Run this report to share students' *Math Inventory* scores and math progress with families and caregivers.



1

Student: Cooper, Maya

School: Williams Middle School  
Teacher: Sarah Foster  
Grade: 5  
Class: 3rd Period  
Group: Group A

February 22, 2019

Dear Parent or Caregiver,

Maya completed the *Math Inventory*, a classroom-based assessment that measures a student's level of mathematics knowledge.

The *Math Inventory* is a computerized test that results in a score, or Quantile® measure, that indicates how well a student understands mathematical skills and concepts along a developmental continuum. A student who scores at the Proficient level by the end of the school year is considered to be performing on grade level and is on track to meet the demands of college and career by the end of high school.

| TEST DATE         | QUANTILE® MEASURE | PERFORMANCE LEVEL |
|-------------------|-------------------|-------------------|
| February 22, 2019 | 605Q              | Proficient        |
| December 13, 2018 | 701Q              | Basic             |

Grade 5 End-of-Year Target Range: 645–771 Quantile®

2

Please contact me if you have questions about this report or how to encourage Maya's mathematical development.

3

Sincerely,

---

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Printed on: 2/22/2019



# School-to-Home Report

## Use the Data

**Who:** Teachers and Parents or Caregivers

**When:** After each *Math Inventory* test administration or when conferencing with parents or caregivers

**How:** Provide information for parents or caregivers about *Math Inventory* student test results, including Quantile measure, Performance Level, and end-of-year goals.

### SEE ALSO

See [page 112](#) for suggested information to provide families prior to sending home this report.

## Understand the Data

- ① Header:** The student's name is listed at the top of the report, followed by related school information.
- ② Student Test Results:** The date, Quantile measure, and corresponding Performance Level for each test are shown.
- ③ Target Quantile Range:** The year-end Target Quantile Range for the student's grade level is shown.

## ► REFLECT ON THE REPORT

Write down when and how you plan to use this report with parents and caregivers.

## Using *Math Inventory* Reports and Data Analytics

### ► PRACTICE WITH DATA

Read the case study below and refer to pages 48–89 to determine the following:

- ***Math Inventory* Data Analytics**

How will the data snapshots help with the task your principal has assigned you?

- **Printed Report Data**

What data from the reports do you find most helpful?

- **Action Plan**

What steps might you take to plan differentiated instruction?

### Case Study

You have just completed the first *Math Inventory* test administration of the school year, and your principal has asked you, as math team leader, to share with your team the current math status of your students. The principal has also asked that you share an action plan for math instruction for this school year that will accelerate growth.

#### DATA ANALYTICS

#### REPORT DATA

#### ACTION PLAN

*I would suggest to our team . . .*

Professional Learning Guide

# Using the Digital Management Tools

## Overview

Access the Student Achievement Manager (SAM) through SAM Central to import students, set up schools and teacher accounts, and manage advanced settings.

### Getting to Know SAM

The Student Achievement Manager (SAM) is a component of SAM Central, a management and reporting system that gathers usage and performance data for many Houghton Mifflin Harcourt software programs, including the *Math Inventory*.

The screenshot shows the SAM Central interface. At the top, there's a navigation bar with links for Home, Roster, Reports, Resources, Books, and Portfolio. Below the navigation bar, the title "MATH 180 Teacher 275" is displayed. On the left, a sidebar titled "My Classes" lists categories like "Classes" (for MATH 180 Teacher 275), "MATH 180 Course 1 Demo", "MATH 180 Course 2 Demo", "MI Standalone", "Groups" (for MI Standalone), and "Students" (for MI Standalone). Under "Students", a list of student names is shown: Aviles, Angelo; Brown, Judy; Bruce, Jaedyn; chicken, chris; Course, math180 course 2 studen; Daniel, Mike; Davis, Trevor; Drummond, Chase; Duong, Gerard; Elliott, Jayrone; Ernst, Hubert; Fackrell, Kyler; feretti, elliana; Frawley, Matt; Griffin, Lee; and Givens, Dakia. The main content area is titled "My Classes" and contains five icons labeled "Roster", "Reports", "Resources", "Books", and "Portfolio". Below these icons is a message: "Click here to learn how to access and use the READ180 Interactive Teacher System (ITS)." A table follows, showing messages filtered by "All Products" and "All Message Types". The table has columns for Type, Message, Product, and Date. The messages listed are: "Math Inventory - Test Activity Report [report] is now ready.", "Math Inventory - Instructional Planning Report [report] is now ready.", "Math Inventory - Student Test Printout Report [report] is now ready.", "Math Inventory - Test Activity Report [report] is now ready.", and "Math Inventory - Proficiency Summary Report [report] is now ready.". Each message has a "Show me..." link. At the bottom of the table, there's a "Delete Checked" button and a note about available programs: "You have these programs available: PS, N, MM, MM, M, R".

SAM Central and SAM both provide tools for:

- Managing class rosters and program settings
- Generating reports on student performance at the individual, group, class, school, and district levels
- Locating helpful resources for instruction

## Navigating SAM

The home screen is the first one you see after logging on to SAM with your username and password. The gray **SmartBar** on the left displays the names of all students enrolled in *Math Inventory*. The color-coded tabs across the top allow you to access each SAM feature to complete key tasks for effective program implementation.

### SmartBar

The **SmartBar** is the core of SAM navigation. It is the gray column along the left side of every SAM screen. It is the quickest route to displaying information about classes and students who are using *Math Inventory*. Anything you double-click in the **SmartBar** will appear in the main display in the center of the screen.

### Color-Coded Tabs

SAM is divided into five main sections, which are identified by tabs along the top of every screen. The tabs are color coded, so you can always see which section you are using with a quick glance.

- **Roster:** Use the yellow tab to enroll students in *Math Inventory* and manage program settings.
- **Reports:** Explore the blue tab to generate data-driven reports for growth monitoring.
- **Resources:** Click the green tab to download teacher and student resources.
- **Books:** This tab is only for *Reading Counts!* users.
- **Portfolio:** This tab contains both messages for the teacher and also student work.



Use SAM Central for quick and easy access to **Roster**, **Reports**, and **Resources** also available in SAM.

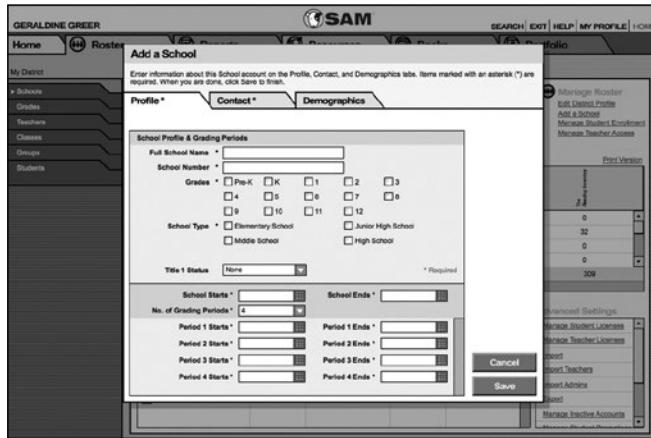
# Using the Digital Management Tools

## SAM | Initial Administrator Setup

Administrators can import roster information using a CSV file upload or manually complete the tasks below in SAM in order for teachers to begin administering *Math Inventory*.

### Add a School

Set up your school in SAM.



### DIRECTIONS

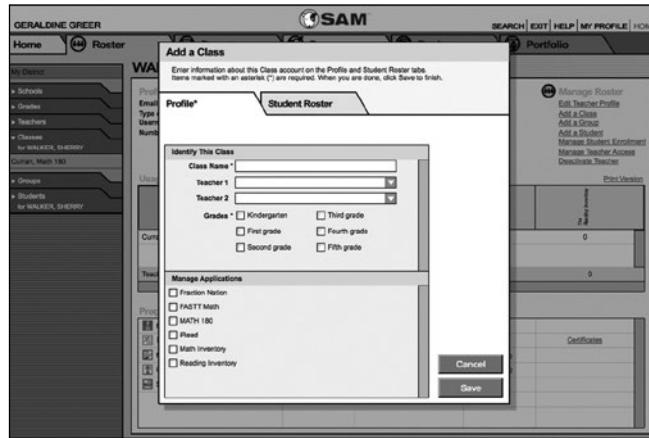
1. Log on to SAM with the default username (**dadmin**) and password (**SAM@dm1n**) and click **Roster**.
2. Click **Add a School** under **Manage Roster** on the district **Profile** screen to open the **Add a School** window.
3. Use the **Profile** tab to enter basic information about the school, including school ID number and grades that are using *Math Inventory*. Items marked with an asterisk (\*) are required.
4. Click **Save** to save your entries and return to your **Profile**. Click **Cancel** to exit without saving your changes.
5. Add additional schools by returning to the main menu and repeating steps 1–4.

#### → TIP

Initially, SAM must be set up by someone with administrator rights to your computer network. A mass upload of roster data is recommended.

### Add a Class

Set up *Math Inventory* classes in SAM.



### DIRECTIONS

1. Log on to SAM with the default username (**dadmin**) and password (**SAM@dm1n**). Double-click a school name in the **SmartBar**.
2. Click **Add a Class** under **Manage Roster** on the school **Profile** screen.
3. Enter the class information in the **Profile** tab of the **Add a Class** window. Follow these recommended naming conventions when entering a class name, teacher name, class period, or program name. For example: "Schirmer, P1, *Math Inventory*."
4. Use the check boxes under **Manage Applications** to associate these programs with the class: *Math Inventory*.
5. Click **Save** to return to the school **Profile** screen. The class name will now appear in the **SmartBar**.

#### → TIP

You can download an import file template from the Import link in SAM; otherwise, manually set up classes first, and then associate teachers, grades, and students.

# SAM | Initial Administrator Setup

Administrators will need to complete the tasks below in SAM Central or SAM in order to begin administering *Math Inventory*.

## Add a Teacher

Add all *Math Inventory* Teachers to SAM.

## DIRECTIONS

1. Log on to SAM with your username and password.  
Double-click a school name in the **SmartBar**.
2. Click **Add a Teacher** under **Manage Roster** on the school **Profile** screen.
3. Enter the teacher's information in the **Profile** tab of the **Add a Teacher** window.

### TIP

When entering information for teachers who are using more than one program in SAM, be sure to assign the same SAM username and password to avoid confusion.

4. Click the **Schools & Classes** tab and use the check boxes to assign the teacher to classes.
5. To allow a teacher to remove students from SAM when exiting *Math Inventory* or leaving the school, click the **Permissions** tab and the **Deactivate Student** check box.
6. Click **Save** to return to the school **Profile** screen.  
The teacher's name will appear in the **SmartBar**.

## Set Performance Levels

Set performance-level names and ranges for reporting.

| Grade | Below Basic  | Basic     | Proficient | Advanced    |
|-------|--------------|-----------|------------|-------------|
| K     | EM544 – EM75 | EM74 – 8  | 9 – 117    | 118 – 295+  |
| 1     | EM235 – 15   | 16 – 116  | 117 – 232  | 233 – 384+  |
| 2     | EM133 – 141  | 142 – 270 | 271 – 382  | 383 – 600+  |
| 3     | EM151 – 276  | 277 – 380 | 381 – 545  | 546 – 815+  |
| 4     | EM110 – 369  | 390 – 533 | 534 – 629  | 630 – 829+  |
| 5     | 77 – 4999    | 540 – 644 | 645 – 771  | 772 – 9545+ |

## DIRECTIONS

1. Log on to SAM with your username and password.  
Double-click **My District** in the **SmartBar**.
2. To access **Math Inventory Settings**, click the **Settings** link next to the *Math Inventory* icon in the **Programs** menu at the bottom of the screen.
3. Click the **Advanced Settings** tab.
4. Click the text boxes to enter new performance-level names and/or ranges.

### TIP

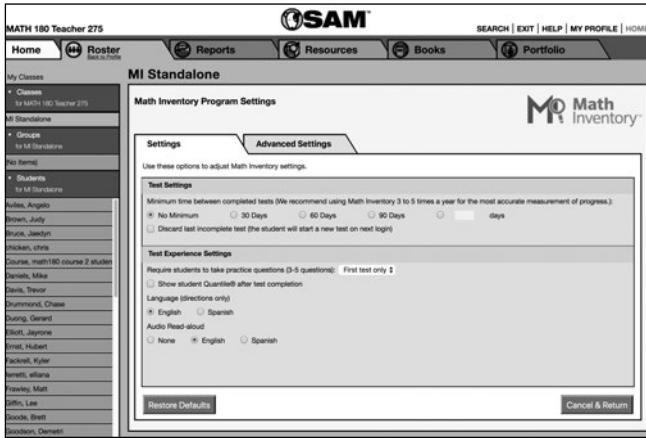
Administrators can reduce or increase the number of performance levels to three or five using the menu under the chart.

## SAM | Teacher Settings

Teachers can complete the tasks below in SAM Central Class Settings or SAM in order to begin administering *Math Inventory*.

### Customize Settings

Customize the settings in SAM Central Class Settings or use the instructions below to customize settings in SAM.



### DIRECTIONS

1. Log on to SAM with your username and password.
2. Double-click on a school, grade, teacher, class, group, or student's name in the **SmartBar** to access the **Profile** screen.
3. To access **Math Inventory Settings**, click **Settings** next to the *Math Inventory* icon in the **Programs** menu at the bottom of the screen.
4. Click the check boxes to customize **Test Experience Settings**.
5. Click **Save & Return** to return to the **Profile** screen, or click **Save** to save the information and stay on **Math Inventory Settings** screen.

#### → TIP

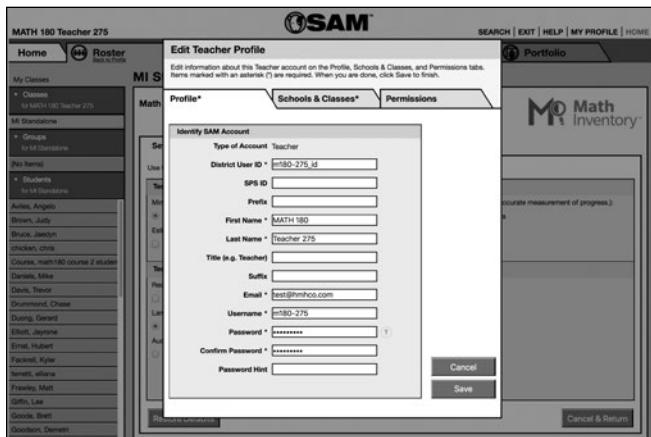
If you do not want students to view their Quantile measures after completing a *Math Inventory* test, uncheck the box next to **Show student Quantile after test completion**.

# SAM | Teacher Settings

Teachers can use SAM Central or SAM to edit their profiles and search for resources.

## Edit a Teacher Profile

Teachers can use SAM Central or SAM to edit their profiles and search for resources.



### DIRECTIONS

1. Log on to SAM with your username and password.
2. Click **My Profile** on the top right of the home screen to open the **Edit Teacher Profile** window.

#### → TIP

You can also access your profile information at any time by clicking your name in the upper-left corner of the SAM Central screen.

3. Make any changes to the fields on the **Profile** or **Schools & Classes** tabs. Items marked with an asterisk (\*) are required.
4. Click **Save** to keep your changes and exit the **Edit Teacher Profile** window.

## Search for Resources

Access state alignments and additional resources.



### DIRECTIONS

1. Log on to SAM with your username and password and click the **Resources** tab.
2. If you know the keyword for a resource, enter it in the **Math Inventory Keyword** field. Then click **Go**.
3. If you do not know the keyword for a resource, select **Math Inventory** from the **Program** menu.

#### → TIP

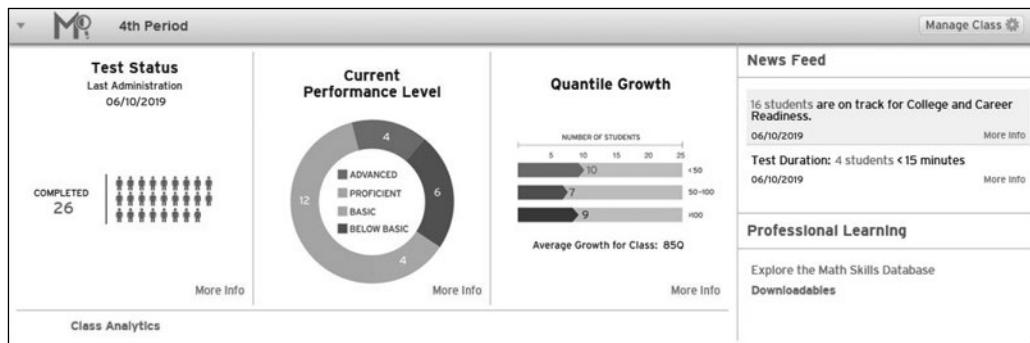
All manuals in SAM Resources are also available in SAM Central by clicking **Downloadables**. For more information on SAM Central downloadables, see **page 134**.

## SAM Central | Home

SAM Central puts your assessment calendar, data snapshots and news regarding student performance and usage, instructional recommendations, and professional learning resources all in one centralized location to make it easy to assess and plan instruction.

### SEE ALSO

You will also find the Gateway to SAM and the product support website in the upper-right corner of the home screen.



1. **Data Snapshots** such as those shown on the home screen above provide interactive data analytics with pop-up windows and in-depth reporting.
2. **News Feed** provides current highlights on student usage and performance and offers ways to look at this information in depth.
3. **Professional Learning** connects you to resources for planning instruction.
4. **Manage Class** allows easy access to student enrollment information, student profiles, and settings.
5. **Class Analytics** provides a depth of information about class and student performance as well as printable reports. It also provides access to the **Manage Class** menu.

# SAM Central | News Feed

SAM Central's News Feed provides current information and alerts to highlight recent achievements and data points that may need further evaluation.

The screenshot shows the SAM Central dashboard for a teacher named John Teacher on Wednesday, June 12, 2019. The dashboard includes sections for Test Status, Current Performance Level (with a donut chart), and Database (with a bar chart). A 'Manage Class' button is visible at the top right. A large circular callout highlights a 'Test Duration' pop-up window. This window lists student names and their test scores: McLaughlin, Stephanie (490); Boone, Cheryl (380); Williams, Anthony (400); and Bell, Ralph (400). It also contains an alert message: '⚠️ Test duration <15 minutes.'

- Click on blue data links in the News Feed to open pop-up windows with student information.
- Click on student names in pop-up windows to look more deeply at student analytics.

## → TIP

Check the News Feed following test administration for ready-to-use information concerning test duration and students who are on track for college and career readiness.

## SAM Central | Class Profile

The Class Profile can be found in the menu under **Manage Class** on the SAM Central home screen. This page allows you to modify the class profile and manage class enrollment in Houghton Mifflin Harcourt applications.

The screenshot shows the SAM Central interface for managing a class named "4th Period". The left sidebar includes sections for Data Snapshots (Test Status, Class Analytics, Student Analytics), Professional Learning (Explore the Math Skills Database, Downloadables), and Manage Class (Class Profile, Roster & Enrollment, Student Profiles). The main right panel is titled "CLASS PROFILE" and contains fields for Class Name (4th Period), Teachers (Teacher 1: Teacher, John; Teacher 2: None), Grades (Fourth grade, Fifth grade, Sixth grade, Seventh grade, Eighth grade), and Manage Applications (iRead, The Math Inventory, The Reading Inventory, MATH 180). A "Save" button is at the bottom right.

### Class Profile Features

- 1. Class Name:** Identify the name of the class.
- 2. Teachers:** Select the primary teacher and add a secondary teacher to the class to support data analysis.
- 3. Grades:** Select the grade of the class.
- 4. Manage Applications:** Manage class enrollment in Houghton Mifflin Harcourt math programs.

# SAM Central | Roster & Enrollment

Easily access and manage roster and enrollment information in SAM Central for *Math Inventory*. The **Roster & Enrollment** screen displays all of the products that are being used in the class. Use the check boxes to remove students from the class and enroll or unenroll them from *Math Inventory*.

| remove                              | STUDENTS           | THE MATH INVENTORY                  | MATH IBO COURSE II                  |
|-------------------------------------|--------------------|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | BLUME, JOY         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | CHO, HENRY         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | COCANOWER, JAIME   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | COLLINS, CHRIS     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | COOPER, MAYA       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | DIXON, KEN         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | ENOKI, JEANETTE    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | GAINER, JACQUELYN  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | GARCIA, MATT       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | HARTSOCK, SHALANDA | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | KOHLMEIER, RYAN    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | MORRIS, TIMOTHY    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | RAMIREZ, JEREMY    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | ROBINSON, TIFFANY  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | TERRELL, WALT      | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

## ➔ TIP

To open licenses for new students, unenroll students that permanently leave the school or district. Use the **Find Student** and **Create Student** buttons to locate new students or add new students to a class.

## SAM Central | Student Profiles

View individual student profiles, modify usernames and passwords, and select demographic information to be included in report filters.

The screenshot shows the SAM Central interface for a class named "4th Period". On the left, a sidebar menu includes "DATA SNAPSHTOS", "Test Status" (showing 26 completed), "Class Analytics", "Student Analytics", "Run a Report", "PROFESSIONAL LEARNING" (Explore the Math Skills Database, Downloadables), and "MANAGE CLASS" (Class Profile, **Roster & Enrollment**, Student Profiles, Usernames & Passwords, Class Settings, Student Digital Portfolio). The "Roster & Enrollment" link is highlighted with a black arrow. The main content area is titled "ROSTER & ENROLLMENT" and displays a table of student names with checkboxes for "THE MATH INVENTORY" and "MATH 10 COURSE II". A note at the top states: "This screen displays all of the products that are being used in this Class. To add or remove products, go to the Class Profile screen and select the appropriate products under Manage Applications." The table lists 26 students, each with a "remove" link and checkboxes for both inventory products.

| remove                              | STUDENTS           | THE MATH INVENTORY                  | MATH 10 COURSE II                   |
|-------------------------------------|--------------------|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | BLUME, JOY         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | CHO, HENRY         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | COCANOWER, JAIME   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | COLLINS, CHRIS     | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | COOPER, MAYA       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | DIXON, KEN         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | ENOKI, JEANETTE    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | GAINER, JACQUELYN  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | GARCIA, MATT       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | HARTSOCK, SHALANDA | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | KOHLMEIER, RYAN    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | MORRIS, TIMOTHY    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | RAMIREZ, JEREMY    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | ROBINSON, TIFFANY  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | TERRELL, WALT      | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | WILLIAMS, ANTHONY  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

### Select Demographics

Use the check boxes on the **Student Profiles** page to select demographics to describe the student and allow you to filter test data on reports according to demographic criteria. Students can be identified by the following demographics:

- AYP
- Ethnicity
- Gender

# SAM Central | Usernames & Passwords

Quickly access students' usernames and passwords to assist with logging on to a *Math Inventory* assessment.

The screenshot shows the SAM Central interface for the '4th Period' class. On the left, there's a sidebar with navigation links: Class Analytics, Current Quantile, Quantile Growth, Student Analytics (which is currently selected), Run a Report, Professional Learning (Explore the Math Skills Database, Downloadables), Manage Class (Class Profile, Roster & Enrollment, Student Profiles, **Usernames & Passwords**), and Class Settings/Student Digital Portfolio. A copyright notice at the bottom of the sidebar reads: 'Copyright © by Houghton Mifflin Harcourt Publishing Company. All rights reserved.' The main content area is titled 'USERNAMES & PASSWORDS' and displays a table with columns: NAME, STUDENT ID, USERNAME, PASSWORD, and PRODUCT. The table lists 18 students, each with a unique STUDENT ID, a specific USERNAME (all ending in 'Welcomel'), and the same PASSWORD ('123456'). The PRODUCT column indicates they all have access to 'MATH 180 Year 1, The Math Inventory'.

| NAME                              | STUDENT ID | USERNAME  | PASSWORD | PRODUCT                             |
|-----------------------------------|------------|-----------|----------|-------------------------------------|
| BELL, RALPH                       | 100002222  | 100002222 | Welcomel | MATH 180 Year 1, The Math Inventory |
| BLUME, JOY                        | 100002020  | 100002020 | Welcomel | MATH 180 Year 1, The Math Inventory |
| BOONE, CHERYL                     | 100007276  | 100007276 | Welcomel | MATH 180 Year 1, The Math Inventory |
| CHAMBERLAND-WASHINGTON, ALEXANDER | 100009385  | 100009385 | Welcomel | MATH 180 Year 1, The Math Inventory |
| CHO, HENRY                        | 100001955  | 100001955 | Welcomel | MATH 180 Year 1, The Math Inventory |
| COCANOWER, JAIME                  | 100004680  | 100004680 | Welcomel | MATH 180 Year 1, The Math Inventory |
| COLLINS, CHRIS                    | 10001570   | 10001570  | Welcomel | MATH 180 Year 1, The Math Inventory |
| COOPER, MAYA                      | 100007499  | 100007499 | Welcomel | MATH 180 Year 1, The Math Inventory |
| DIXON, KEN                        | 100000249  | 100000249 | Welcomel | MATH 180 Year 1, The Math Inventory |
| ENOKI, JEANETTE                   | 100007213  | 100007213 | Welcomel | MATH 180 Year 1, The Math Inventory |
| GAINER, JACQUELYN                 | 100001964  | 100001964 | Welcomel | MATH 180 Year 1, The Math Inventory |
| GARCIA, MATT                      | 100007042  | 100007042 | Welcomel | MATH 180 Year 1, The Math Inventory |
| HARTSOCK, SHALANDA                | 100002035  | 100002035 | Welcomel | MATH 180 Year 1, The Math Inventory |
| KOHLMEIER, RYAN                   | 100002124  | 100002124 | Welcomel | MATH 180 Year 1, The Math Inventory |
| MCLAUGHLIN, STEPHANIE             | 100003084  | 100003084 | Welcomel | MATH 180 Year 1, The Math Inventory |
| MORRIS, TIMOTHY                   | 100000953  | 100000953 | Welcomel | MATH 180 Year 1, The Math Inventory |
| NOLAN, OLIVIA ROSE                | 100000858  | 100000858 | Welcomel | MATH 180 Year 1, The Math Inventory |
| RAMIREZ, JEREMY                   | 100007263  | 100007263 | Welcomel | MATH 180 Year 1, The Math Inventory |
| ROBINSON, TIFFANY                 | 100008773  | 100008773 | Welcomel | MATH 180 Year 1, The Math Inventory |

## → TIP

Print the student usernames and passwords to have available during test administration for those needing assistance with logging on. Distribute individual usernames and passwords on index cards for younger students.

## SAM Central | Class Settings

Use SAM Central to easily and quickly access **Class Settings** for *Math Inventory*.

The screenshot shows the SAM Central interface for a class named "4th Period". On the left, there's a sidebar with "Class Analytics" and "Student Analytics" sections, and a "MANAGE CLASS" section which is expanded to show "Class Settings" (highlighted with a red arrow). Other options in the sidebar include "Run a Report", "PROFESSIONAL LEARNING", "Explore the Math Skills Database", "Downloadables", "Class Profile", "Roster & Enrollment", "Student Profiles", "Usernames & Passwords", and "Student Digital Portfolio". The main content area is titled "CLASS SETTINGS". It has three main sections: "Select Program" (set to "Math Inventory"), "Select Cohort" (listing student names like Bell, Ralph, Blume, Joy, Boone, Cheryl, etc.), and "Select Settings" (with dropdowns for "Minimum time between completed tests" (set to "No Minimum") and checkboxes for "Require students to take practice questions (3-5 questions)" (set to "First test only"), "Discard last incomplete test (the student will start a new test on next logon)", and "Show student Quantile® after test completion"). A "Save" button is at the bottom right.

### Settings

1. **Minimum time between completed tests:** Use this item to set testing windows.

Options include:

- No Minimum
- 30 Days
- 60 Days
- 90 Days
- Custom

2. **Require students to take practice questions:** Students will receive three to five practice questions on the first *Math Inventory* test administration. Use this item to require practice items on all tests.

3. **Discard last incomplete test:** Check this box to allow students with incomplete tests to start a new test on the next logon.

4. **Show student Quantile® after test completion:** Check this box to remove the test score from the completion screen.

# SAM Central | Run a Report

You can view data snapshots and class and student analytics and schedule and run reports. Run a report now or schedule one for later to save time.

The screenshot shows the SAM Central dashboard for '4th Period'. On the left, there's a sidebar with 'DATA SNAPSHTOS' showing 'COMPLETED 26' with a bar chart, 'Class Analytics' (Current Quantile, Quantile Growth), 'Student Analytics', and a prominent 'Run a Report' button with a right-pointing arrow. Below these are sections for 'PROFESSIONAL LEARNING' (Explore the Math Skills Database, Downloadables) and 'MANAGE CLASS' (Class Profile, Roster & Enrollment). The main area is titled 'RUN REPORT' and contains fields for 'Level' (Teacher), 'Program' (Math Inventory), 'Report' (Performance Level Growth Report), 'Time Period' (Today), and 'Generate Report' options ('Now' or 'Select a Date'). A list of scheduled reports is shown on the right, including 'The Math Inventory Growth Report' (Ready, 07/24/2019), 'The Math Inventory Progress to College & Career Report' (Scheduled, 07/24/2019), 'The Math Inventory Growth Report' (Ready, 07/24/2019), and 'The Math Inventory Growth Report' (Scheduled, 02/11/2019). A 'Run Report' button is located at the bottom right of the report form.

## Run or Schedule a Report

- 1. Level:** Select the report level: teacher, class, or student. The teacher level displays data from all of the teacher's classes. The class level displays data for an individual class. The student level displays data for individual students.
- 2. Program:** Select the program from the menu.
- 3. Report:** Choose the program report from the menu. A short description of each report is provided.
- 4. Time Period:** Select the time period or create a custom time period.
- 5. Generate Report:** Choose to run the report now or schedule it for later. A message will appear in your News Feed when the report is ready.

## Reflecting on SAM Central

### ► USING SAM CENTRAL

Reflect on the features below and write in the boxes when and how you plan to use each feature to improve your data-driven instruction.

#### HOME AND NEWS FEED

#### CLASS PROFILE

#### STUDENT PROFILES

#### CLASS SETTINGS

#### REPORTS SCHEDULER

Professional Learning Guide

# Best Practices

## Overview

Use this list of best practices as a checklist to complete before and after each test administration in order ensure accurate results.

### Why Are Accurate Results Important?

Accuracy means reliability and validity, or consistency and precision. Accuracy is important with *Math Inventory* because it is an adaptive assessment that bases its starting point for each test on the Quantile measure of the previous test. *Math Inventory* results influence planning, instruction, and progress monitoring. Steps that you take before and after the test administrations can increase the accuracy of students' test results.

### Before Initial Testing

At least one week before the test, remember to do the following:

1. Enroll students in *Math Inventory*. See [page 101](#) for more information on student enrollment using SAM Central or the Student Achievement Manager.
2. Print the *Math Inventory* Student Roster. Share logon information with students.
3. Introduce students to *Math Inventory*. Emphasize that the *Math Inventory* test will help them by providing an assessment of their math level. Explain that it is computer adaptive, so questions become more challenging depending on responses. Also clarify that the test is designed to show teachers what students know, and what they don't know, and therefore some incorrect answers are expected. Encourage them to do their best on difficult items, and move on. They can skip up to three items per test without impacting their scores.
4. Model procedures for test navigation and using question skips.
5. Schedule the test. Ensure that all students have an opportunity to complete the test without feeling rushed. Assign time slots for taking the test if there is a limited number of computers.

### After Initial Testing

After students take the test, do the following:

1. Review data snapshots and *Math Inventory* reports.
2. Check the News Feed and run the Incomplete Test Report to determine which students still need to complete the test.
3. Use the Instructional Planning Report to inform creation of groups for targeted math instruction.
4. Schedule one-on-one conferences at which you share Quantile measures and math growth goals using the Progress to College and Career Report.
5. Plan classroom instruction. Use the Learning Resources in SAM Central to help target your students' Quantile measures to create units for the whole class and small groups.
6. Send home the School-to-Home Report, which informs families of their child's Quantile measure and strategies to help support him or her.

## Before Subsequent Tests

Before the next test, do the following:

- 1. Review previous test results.** Print the Student Test Printout and discuss incorrect responses and misconceptions during short, one-on-one conferences.
- 2. Discuss growth goals.** Review initial test scores, current results, and progress toward growth goals using the Progress to College and Career Report.
- 3. Inform students and families about test dates.** Encourage students to be well rested on test day.

## After Subsequent Tests

After students take each *Math Inventory*, do the following:

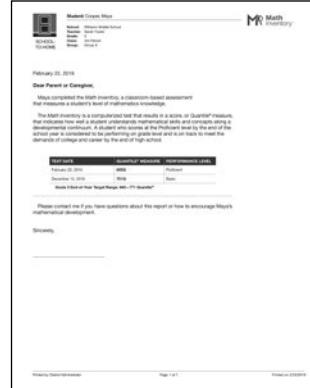
1. Check SAM Central News Feed and Data Snapshots for test highlights.
2. Review *Math Inventory* reports. Review class reports such as the Growth Report and Instructional Planning Report to make instructional decisions and monitor growth.
3. Conference with students. Use the Progress to College and Career Report or Student Test Printout to review individual results. Celebrate success and track progress toward math goals.
4. Discuss results with administrators. Print the Growth Report and Instructional Planning Report to show administrators the range of Quantile measures in your class and to discuss student progress.
5. Involve families. Print and send home the School-to-Home Report to update families and caregivers on their child's progress.

## Assessment Timeline

Use the timeline below to prepare for *Math Inventory* test administration, evaluation of test results, and targeted instruction throughout the school year.



- Introduce students to the ***Math Inventory*** and review test-taking strategies.



- Schedule 35 minutes of computer lab time and administer the ***Math Inventory assessment***.

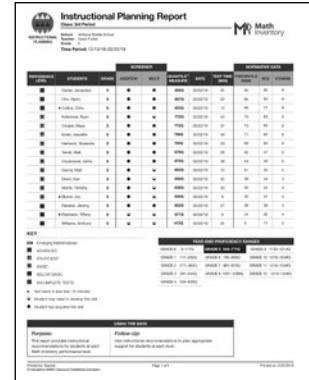
- Send home the **School-to-Home Report** to share test results.

- Send home **Parent Letter** to introduce families to *Math Inventory*.

## First Test

- Enroll students in **SAM Central** and provide them with logon information.

- Review ***Math Inventory* reports** and data analytics to screen for intervention, group for rotations, and plan for instruction.

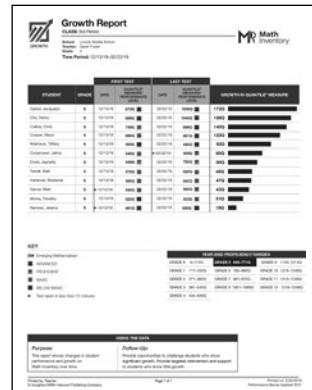


# Assessment Timeline

- Schedule remaining two to four testing dates (8–9 weeks apart) for the school year and inform students and parents.



- Check whether new students are enrolled in *Math Inventory* before their first test.

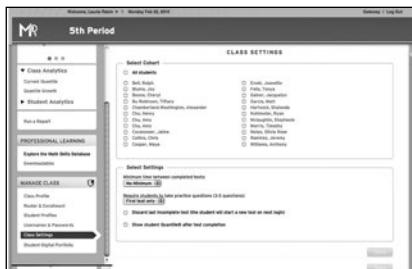


- Review the **reports** and conference with students to share growth and set goals.

## Subsequent Tests

- Schedule 35 minutes of lab time and administer the *Math Inventory* assessment.

- Delete any incomplete tests and schedule students to retake the assessment.



- Adjust instructional groups and curriculum planning to target needs.



## **Introducing Families to *Math Inventory***

Before administering the *Math Inventory* test, introduce parents and caregivers to the purpose and format of the test.

## **Share the Purpose of *Math Inventory* Testing**

Emphasize that the purpose of *Math Inventory* is to determine a student's math level, set goals, and monitor progress. Explain that *Math Inventory* is a formative assessment that you can use to assist with your instruction, as opposed to the high-stakes summative assessments students take at the end of the school year. Students' test results are reported as Quantile measures, which helps you to provide math support based on each student's current level of math understanding.

## **Provide Materials to Families**

Provide the following two materials to families to help them better understand *Math Inventory* test administration and results.

- **Parent Letter:** Send home the parent letter in English or Spanish prior to testing to help explain the test and provide the upcoming testing dates.
  - **Quantile Resources:** Direct families to [www.quantiles.com](http://www.quantiles.com) for more information on Quantile measures and Quantile-related resources, such as math games and activities they can do at home to support their child's learning.



The Introductory Parent Letter can be found in SAM Central downloadables or SAM Resources by using the keyword *Math Inventory Intro Letter English* (or Spanish).

|   |  |                                    |
|---|--|------------------------------------|
| <p>Name _____</p>   | <br><b>Math<br/>Inventory</b> | <b>Parent Letter<br/>(English)</b> |
| <p><b>Dear Parent or Caregiver:</b></p> <p>This year your child will complete <i>The Math Inventory</i>, a classroom-based assessment that measures mathematics achievement and growth from Kindergarten through Algebra II. <i>The Math Inventory</i> is designed to evaluate students' mathematics performance, monitor their progress, and set goals for instruction.</p> <p>The assessment is a short, online experience that assesses either early numeracy skills (Grades K and 1) or basic math facts (grades 2 and above) to identify students who may benefit from instruction in these essential areas. The assessment continues with a series of items that help measure students' mathematics knowledge. Test results are reported using a measure called the <i>Quartile®</i> measure. Think of the <i>Quartile</i> measure as you would the reading from an ordinary thermometer. Just as you can use the temperature on a thermometer to decide what kind of jacket to wear, a <i>Quartile</i> measure may be used to decide what mathematics a student is ready to tackle next.</p> <p>Your child will take <i>The Math Inventory</i> on _____<br/> <span style="float: right;">(test date)</span></p> <p>Research shows that test takers perform best when they have done the following:</p> <ul style="list-style-type: none"> <li>• Get a good night's sleep the evening before the test.</li> <li>• Eat a healthy breakfast the morning of the test.</li> <li>• Participate regularly in class</li> <li>• Believe that if they try hard they can do well on the test!</li> </ul> <p>Once your child has taken <i>The Math Inventory</i>, a School-to-Home report will be sent to you with the results. Thank you for taking the time to support your child's mathematics development. For more information about <i>The Math Inventory</i>, please visit <a href="http://mhinfo.com/mathinventory">mhinfo.com/mathinventory</a>. If you have any questions, please feel free to contact me.</p> <p>Sincerely,</p> <p style="text-align: right;">_____</p> |  |                                    |

|   |   |                                    |
|---|---|------------------------------------|
| <p>Name _____</p>   |  <b>Math<br/>Inventory</b> | <b>Parent Letter<br/>(Spanish)</b> |
| <b>Queridos padres o representantes:</b>  |   |                                    |
| <p>Este año su niño o niña completará el Math Inventory, un examen basado en el salón de clase que evalúa el éxito matemático y el crecimiento desde el kindergarten hasta la álgebra 2. El Math Inventory es diseñado para evaluar el rendimiento matemático de los estudiantes, verificar el progreso de los estudiantes en matemáticas e establecer metas para la enseñanza de matemáticas.</p> <p>El examen comienza con una medición de las progresos, que evalúa habilidades numéricas tempranas (kindergarten) o primer grado a técnicas matemáticas básicas (segundo grado y superior) para identificar estudiantes que se benefician de instrucción en estas áreas esenciales. El examen continúa con una serie de elementos que ayuda evaluar el conocimiento de las matemáticas de los estudiantes. Para presentar los resultados del examen se usa una medida llamada la medida Quantile®. La medida Quantile se puede comparar con la medida de su estudiante. Así como se usa la medida de un terremoto para decir cuál abrió fisura, la medida Quantile se puede usar para decir qué matemática un estudiante debe enseñarse a continuación.</p> |   |                                    |
| <p><b>Su niño o niña presentará el Math Inventory el dia _____</b></p> <p style="text-align: center;">(Fecha del examen)</p> <p>Los estudios de investigación han demostrado que los estudiantes obtienen mejores resultados cuando:</p> <ul style="list-style-type: none"> <li>• duermen bien la noche anterior al examen</li> <li>• toman un desayuno nutritivo el día del examen</li> <li>• asisten a la escuela con regularidad</li> <li>• creen que si se esfuerzan pueden obtener un buen puntaje</li> </ul> <p>Después del examen, se les enviará un informe de la Escuela al hogar con los resultados. Gracias por dedicar el tiempo necesario para ayudar al desarrollo de matemáticas de su niño o niña. Por favor, consulte <a href="http://mcgraw-hill.com/mathinventory">http://mcgraw-hill.com/mathinventory</a> para obtener más información sobre el examen, o comuníquese conmigo si tienen preguntas.</p> <p>Agradecemos su apoyo.</p> <p style="text-align: right;">Atentamente,</p> <p style="text-align: right;">_____</p>   |   |                                    |

# Introducing Students to *Math Inventory*

Support students to do their best on the test by creating a comfortable environment. Ensure that students understand the purpose of the assessment to increase accuracy of test results.

## Preparing Students for the *Math Inventory* Test

Before administering the *Math Inventory* test, plan time to prepare students for the testing experience. Emphasize that the purpose of *Math Inventory* is to determine a student's math level, set goals, and monitor progress. Clarify that *Math Inventory* tests readiness to learn, not mastery of content. Consider the following tips to ensure that students are prepared to do their best on *Math Inventory*:

- Use an interactive whiteboard and a sample student account to do a walk-through of the *Math Inventory* experience and test format. Remember to delete the student from SAM afterward.
- Explain that the test is untimed. Remind students to read each question carefully and that they can skip up to three items per test without impacting their scores. After 30 answered items, the test is typically complete. However, after 60 minutes of work time, 25 or more completed items will end the test. Fewer than 25 completed items triggers a message to complete the test another time. If students need to complete the test at another time, for any reason, they can press Escape to exit and save their responses.
- Share that the test is adaptive. Questions become easier or more challenging, depending on students' performance. Emphasize that students will not be able to return to previous questions.
- Tell students that they all will likely finish at different times. The test time does not indicate that they are doing poorly and it's not a race.
- Clarify how the test works, so that students don't spend time trying to answer questions about content they don't know. Emphasize that when an adaptive test gives students a hard question, it is most likely because they are performing well and that it's OK to skip the question or to not know the answer. Clarify that you need to know what they *do not understand* so that you can help them learn it. That means a successful *Math Inventory* test will have a score of about 50% correct and 50% incorrect.
- Inform students that there is an on-screen calculator available for some—but not all—questions. Provide high school students with access to a graphing calculator with functionalities similar to that of a TI-84.
- Show students the formula sheet and review key formulas before the exam.
- Emphasize that students' test results are reported as Quantile measures, which helps you provide math support based on each student's current level of math understanding.

### → TIP

You may want to set up a test student in SAM Central to model taking the Early Numeracy Screener or Fact Screener and practice test, especially for younger students. Make sure to delete any test accounts from SAM Central before beginning student testing so the data will be clean.

### ► REFLECTION

It's important to prepare my students for testing because . . .

# Preparing for the Assessment

Refer to this page to help prepare students for *Math Inventory* by explaining what to expect before, during, and after completing the test.

## What Is *Math Inventory*?

*Math Inventory* is an untimed, computer-adaptive assessment that determines your readiness to learn mathematics. Notice that unlike some other tests you take, *Math Inventory* tests your readiness, not your mastery. Read each question carefully and choose the appropriate answer.

## Why Take *Math Inventory*?

A Quantile measure is a way to determine your level of math understanding. Your Quantile measure increases as you continue to grow in your understanding of new math skills and concepts that we will learn throughout the school year.



Provide the information on this page to all test proctors in order to create consistent testing conditions.

### BEFORE THE TEST

Before the test, give these instructions to students:

- You will complete a number of practice test items—pay attention to the practice test. It checks that you understand the test directions.
- If you have any questions before continuing, ask your teacher.

### DURING THE TEST

Give these instructions to students to let them know what they should do during the test:

- You will answer 30 multiple-choice questions. (If you are still working after 60 minutes, the test will end if you have completed 25 or more items. If you have completed fewer than 25 items, you will receive a message to come back later and keep working.)
- Take your time and read each question carefully before choosing an answer.
- Each of you has a unique test that is different from that of your peers.
- The questions adapt to your level of math understanding.
- Use scratch paper to work out the problems.
- If you need to quit before completing the test, click **Log Out** to exit your test.

### AFTER THE TEST

After the test, give these instructions to students:

- You will see a number that shows your Quantile measure—write it down.
- Your teacher will use this information to provide math practice that is just right for you.
- If you finish early, work on a quiet activity until everyone has completed the test.
- Remember to write your name on your scratch paper and turn it in to your teacher.

# Supporting Positive Test-Taking Strategies

Embedded supports in *Math Inventory* help students develop their test-taking skills.

By creating a supportive testing environment, you can help students succeed on standardized tests in all subject areas.

## Test-Taking Strategies

Before administering the test, reinforce appropriate test-taking strategies. Practice solving items as a class and modeling the way in which you would arrive at an answer. Review these basic strategies:

- Read questions carefully.
- Use the option to have instructions and test questions read aloud.
- Estimate before computing.
- Use scratch paper.
- Check answers.
- Pause between items.

## Growth Mindset Feedback

Based on years of research by Stanford University's Dr. Carol Dweck, we know that students who learn that intelligence is something that can be developed rather than something that is static show greater motivation in school, better grades, and higher test scores ([www.mindsetworks.com](http://www.mindsetworks.com)). Students who take this growth mindset may find testing less stressful, which could help to improve their *Math Inventory* test scores.

*Math Inventory* incorporates growth mindset feedback throughout the test to build resilience and motivate students to take the assessment seriously. You can support growth mindset in your students prior to testing in the following ways:

- **Celebrate effort**, and encourage students to persevere to solve challenging math problems.
- **Set math learning and achievement goals** with students, and discuss how they can work toward these goals.
- **Encourage focus** during test-taking as well as any problem-solving activity to help students to give their best efforts to the task at hand.

*Math Inventory* includes two sets of growth mindset messages: one for Kindergarten and Grade 1 and another for Grades 2 and above. The feedback is in the form of audio prompts triggered by performance under the following conditions:

- Student answers 4 items in a row correctly.
- Student answers 4 items in a row incorrectly.
- Student completes 20 items.
- The test takes longer than 30 minutes.

# Administering the Assessment

## Creating a Comfortable Testing Environment

When students begin their assessment, you should:

| <input type="checkbox"/> | Explain the test format to students and review several sample questions with the class.  |
|--------------------------|--|
| <input type="checkbox"/> | Emphasize that the test is not a race and not meant to be competitive. Students will have tests of different lengths and will finish at different times, so they should take their time and do their best. |
| <input type="checkbox"/> | Provide paper and pencil for the students to use during the test to help keep track of their thinking.   |

# Monitoring Students During the Assessment

## Monitoring Test Alerts

*Math Inventory* Assessment will provide alerts to students during the Early Numeracy Screener or practice test, directing them to get their teacher for help if they are performing poorly. Here are recommendations for supporting students that receive these alerts during test administration.

- **Early Numeracy Screener Alert:** Students that receive this alert may need to develop early numeracy skills, such as counting and simple quantity comparisons. These skills are essential to successfully completing *Math Inventory* and receiving an accurate Quantile measure. Direct these students to log off of *Math Inventory* and work with them on these skills before further testing with *Math Inventory*.
- **Practice Test Alert:** The items on the practice test are designed to be a few grades below grade level so that students don't struggle to find the correct answer. Students who answer any of the first three practice test items incorrectly will receive an alert. Monitor these students while they complete two additional practice test items to ensure that they understand the test format and directions.

## Monitoring Test Administration

Attentiveness to students' needs during the test will ensure that the test results are valid and reflect students' readiness to learn. Consider the following:

- **Ensure** that students understand the directions: Remember that students will be prompted to see a teacher if they get a question wrong on the practice test. If this occurs, see the recommendations above.
- **Circulate** the classroom: Look for students who have questions, need technical assistance, or are logging on for the first time.
- **Encourage** students to give their best effort: Watch for students who are quickly clicking through the questions. This may indicate that they are not putting forth their best effort.
- **Allow** students to take a break: Encourage stretching or a water break if students need a quick break during the test.
- **Identify** students demonstrating fatigue or frustration: Consider asking these students to save the incomplete test and complete it after the break or on another day.

### TIP

Ensure that all test proctors follow the same procedures during testing to improve test accuracy.

## Planning for Successful *Math Inventory* Administrations

### ► REFLECTING ON TESTING

Use the prompts below to reflect on the steps you plan to take to successfully administer the *Math Inventory* test in order to get the best efforts from your students and the most accurate results.

#### BEFORE THE TEST

*To prepare my students before the test, I plan to . . .*

#### TESTING ENVIRONMENT

*I can create a positive testing environment by . . .*

#### DURING TEST ADMINISTRATION

*During testing, I will remember to . . .*

Professional Learning Guide

# **Connecting Assessment to Instruction**

## Planning Instruction with Quantile Measures

The chart on the following page indicates how to match students to skills and concepts that are appropriate for instruction or independent practice. Students' Quantile measures indicate their readiness for instruction on skills and concepts within a range of 50Q above and below their Quantile measure. The Progress to College and Career Report lists priority skills and concepts that are appropriate for each student based on the student's Quantile measure.

### Scaffolded Instruction

When planning introductory instruction, it is best to choose materials that are within 50Q of students' Quantile measure. When students receive instruction on new skills and concepts at their Quantile measure, they are engaged at their learning frontier. However, planning instruction for each of the students in a class can be difficult to do with a large class of students that have a wide range of Quantile measures.

Therefore, if the core curriculum is outside of the student's Quantile range, the student can be supported by scaffolding the instruction with prerequisite skills and concepts to help build a bridge between what the student is ready to learn and the grade-level instruction necessary for success. Prerequisite skills and concepts that scaffold the grade-level skill or concept for instruction can be found by viewing the skill or concept's Knowledge Cluster.

### Independent Practice

When students are released to work independently, they should be successful with skills and concepts that are about 50Q to 250Q below their Quantile measure. The prerequisite and supplemental skills and concepts that support the grade-level instruction are good for independent work such as homework and practice.

## Using Quantile Measures in Your Classroom

Use the chart below to plan instruction and practice with Quantile measures.

| Quantile Range  | Purpose  | Recommended Context   | Student Experience  |
|---|--|---|---|
| <b>50Q above to 50Q below</b><br>the student's Quantile measure | Instructional level  | This is the level where the student is ready to be introduced to material and supported through learning new content. | <b>Appropriately Challenging</b><br>This is the student's target instructional range. Students have the prerequisite skills needed and are ready to learn this material.<br><br>At an appropriate level of challenge, neither frustration nor boredom will occur. |
| <b>50Q to 250Q below</b><br>the student's Quantile measure      | Build fluency with use and application of mathematics skills and concepts. | Once the student has received instruction on this content, practice should be successful.                             | <b>Building Fluency</b><br>The student demonstrates a sufficient control of skills and concepts to practice and apply them in novel contexts.<br><br>After instruction and guided practice students are ready to practice this material independently.            |
| <b>50Q (or more) above</b><br>the student's Quantile measure    | Not recommended  | The student is unlikely to have the prerequisite knowledge to be successful with concepts or skills at this level.    | <b>Frustrating</b><br>This is the student's frustration zone, except in cases where the student has extensive scaffolds and additional instructional support.   |

# Differentiating with Quantile Measures

Use *Math Inventory* report data and the Math Skills Database to help differentiate instruction based on your students' Quantile measures.

## Using *Math Inventory* to Individualize Instruction

To ensure that your students are on track for Algebra II and beyond, it is important to fully understand each student's current level of math understanding and to differentiate and plan math instruction accordingly. The following *Math Inventory* resources will help you plan for and differentiate math instruction:

**Data Reports:** Run the Instructional Planning Report to identify appropriate intervention groups and the Progress to College and Career Report to get a more in-depth look at individual students' readiness for instruction. *Math Inventory* data reports will help you plan for individual, small-group, and whole-group instruction.

**Math Skills Database:** Review the Knowledge Cluster to plan for instruction before teaching a new concept or skill. Note the prerequisite skills that will support your students. Incorporate these skills into the lesson, or set aside time for students who need additional support with the prerequisite and supplemental skills.

## Planning for Differentiation and Intervention

Use your students' performance levels from the Instructional Planning Report to differentiate math instruction. Identify and support students scoring in the Basic and Below Basic levels for intervention. Highlight Proficient- and Advanced-level students to discuss how best to support their continued growth with on-grade level and impending math skills and concepts. Use the Math Skills Database to plan differentiated math instruction in the following differentiated math classroom settings:

**Whole-Group Instruction:** During whole-group instruction, scaffold lessons to include prerequisite and supplemental skills, and challenge advanced students with impending skills. Use the Math Skills Database to determine the Knowledge Cluster to support students in each performance level.

**Small-Group Instruction:** Divide students into small groups during the math lesson to provide targeted support for groups in each performance level.

**Individualized Support:** Use pull-out intervention and provide individualized support for students in the Below Basic performance level.

# Whole-Group Instruction

The Math Skills Database in the SAM Central Learning Resources will help you scaffold and review critical prerequisite skills when teaching the grade-level curriculum.

## Core Instruction

A comprehensive mathematics program includes instruction and independent practice. Instruction is the time when students build new concepts and skills. Independent practice is when students work on developing fluency with those skills and concepts. Instruction at an appropriate level is an excellent way to motivate students to engage more with mathematics, and, by engaging more, students can ultimately achieve more. When students are working on skills and concepts that are both required for their grade level and within their level of understanding, they have a greater chance of understanding and applying the content you are teaching.

## Using Data to Support Whole-Group Instruction

To target support for students during whole-group instruction, follow these steps:

1. Run the **Instructional Planning Report** and **Growth Report** for a snapshot of your students' readiness for instruction.
2. Identify the **Quantile measure** of the QSC you plan to teach, and compare it with your students' Quantile measures.
3. Use the Math Skills Database to view the selected QSC's Knowledge Cluster. During the lesson, reinforce **prerequisite QSCs** to provide students with the foundational understandings required for success with the selected skill. Include these skills as a warm-up or embed them into the lesson.
4. During independent practice, **support students with Quantile measures below the target QSC** to ensure they understand the new concept or skill.
5. **Prepare resources before the lesson** to provide students with additional practice focusing on critical prerequisite and supplemental skills and to challenge students with impending skills.



Access the Math Skills Database in SAM Central **Professional Learning** or [www.quantiles.com](http://www.quantiles.com) to search for and download math resources by QSC ID and Quantile measure. Resources include videos, practice sheets, lessons, and activities.

## Small-Group Instruction

Use the Instructional Planning Report to group students for targeted support based on their performance levels.

### Targeting Instruction in Small Groups

Within any one grade level, there will be a range of readiness for instruction levels. For many students, high-quality, whole-group instruction with targeted small-group interventions is sufficient for mastery of math concepts and skills. Use students' Quantile measures to determine their readiness for instruction and strategically form small groups. During small-group instruction, provide students in need of a stronger foundation with resources focusing on supplemental and prerequisite skills and concepts. Extend learning with impending skills for students who demonstrate mastery of the target mathematics.

### Using Data to Support Small-Group Instruction

To help target support for students with small-group instruction, follow these steps:

1. Run the **Instructional Planning Report** to form small groups for targeted instruction. Consider grouping students by performance level.
2. Identify the **QMeasure** of the QSC you plan to teach using the Math Skills Database, and take note of the Knowledge Cluster, including prerequisite, supplemental, and impending skills.
3. **Compare the QMeasure** of the selected skill or concept with your students' Quantile measures from the Instructional Planning Report.
4. During the whole-group lesson, scaffold instruction to ensure reinforcement of the **prerequisite and supplemental QSCs**.
5. Provide small groups with targeted support and resources focusing on the **prerequisite and supplemental QSCs** that make up QSC's Knowledge Cluster. Include work with **impending QSCs** to challenge advanced students. Prepare resources supporting these skills and concepts before the lesson.

# Individualized Support

Math Inventory reports provide valuable information on students who may benefit from individualized support.

## Identifying Students for Intervention

Tier 3 of the Response to Intervention model is intensive intervention. Students who place in the Below Basic performance level after the first test administration are good candidates for pull-out intervention services and specific support in the classroom. Work with your school's administration to determine how best to provide time for these students to rebuild the prerequisite skills they need to achieve success with the grade-level math curriculum.

## Targeting Support

To target support for students identified for pull-out intervention or individualized support, follow these steps:

1. Run the **Instructional Planning Report** and review students in the Below Basic performance level. Students in this performance level have demonstrated a readiness to learn content that is two or more years below grade level.
2. Run the **Progress to College and Career Report** for each student in the Below Basic performance level to view a list of the priority skills and concepts that will help prepare students for the grade-level math curriculum.
3. During pull-out intervention or through individualized support, provide appropriate instruction and practice with each student's **priority skills and concepts** from the Progress to College and Career Report.
4. After the second *Math Inventory* test administration, run the **Progress to College and Career Report** to determine individual students' Quantile growth.
5. If time allows, print the **Student Test Printout** and review the test with individual students to determine how you can further support them.
6. Review data snapshots and other student analytics and report data after each *Math Inventory* test to determine student progress over time and to gauge the effectiveness of the targeted intervention and individualized support.

## Reflecting on Differentiation

### ► UTILIZING RESOURCES

In the boxes, write your reflections on how best to use the following *Math Inventory* resources to inform and differentiate instruction and plan support:

- **SAM Central Data Analytics and Reports**

SAM Central Data Analytics and Reports will help me differentiate instruction by . . .

- **Math Skills Database**

I will use the Math Skills Database to . . .

- **Whole-Group Instruction and Small-Group Instruction**

One way to effectively differentiate math content during instruction is to . . .

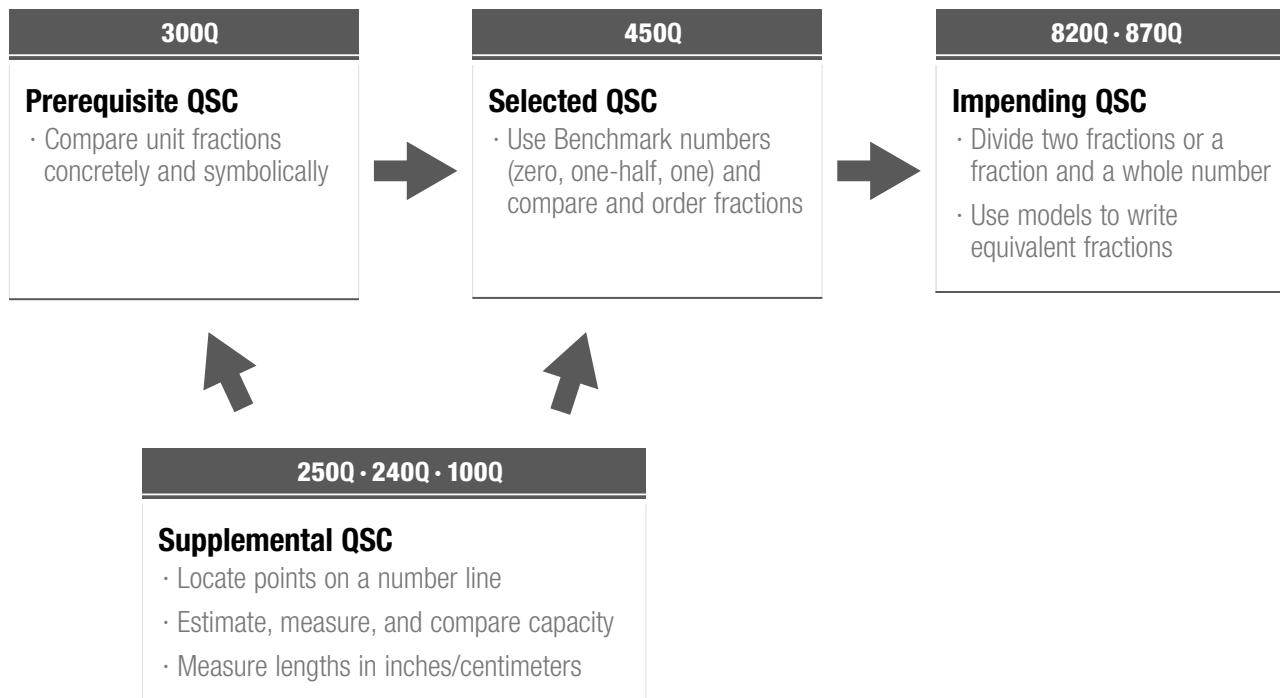
### SAM CENTRAL DATA ANALYTICS AND REPORTS

### MATH SKILLS DATABASE

### WHOLE-GROUP INSTRUCTION AND SMALL-GROUP INSTRUCTION

# Planning with Knowledge Clusters

When teaching a specific skill or concept, it is easy to lose sight of the whole picture. Before teaching a new skill or concept, it is crucial to understand the prerequisite and supplemental mathematics students need in order to achieve success with the selected skill. It is equally important to know the skills and concepts that support students who are ready for a challenge. Knowledge Clusters provide a complete picture of the trajectory of skills and concepts that relate to one another. Use Knowledge Clusters to get an at-a-glance preview of the skills and concepts that support and extend student learning of the target mathematics.



## ► REFLECTION

Looking at the whole picture of the Knowledge Cluster when planning to teach new math skills and concepts is important because . . .

## Planning with Knowledge Clusters

### ► PRACTICE WITH KNOWLEDGE CLUSTERS

Practice thinking about the whole picture with an upcoming skill or concept you are planning for instruction. Use your instructional materials and the Math Skills Database to identify and describe the skills below.

#### CHOOSE SKILL(S) OR CONCEPT(S)

*An upcoming skill or concept I'm choosing for instruction and its Quantile measure is . . .*

#### PREREQUISITE SKILLS

*Two skills or concepts I will incorporate into my lesson to serve as prerequisites to my selected skill are . . .*

#### SUPPLEMENTAL SKILLS

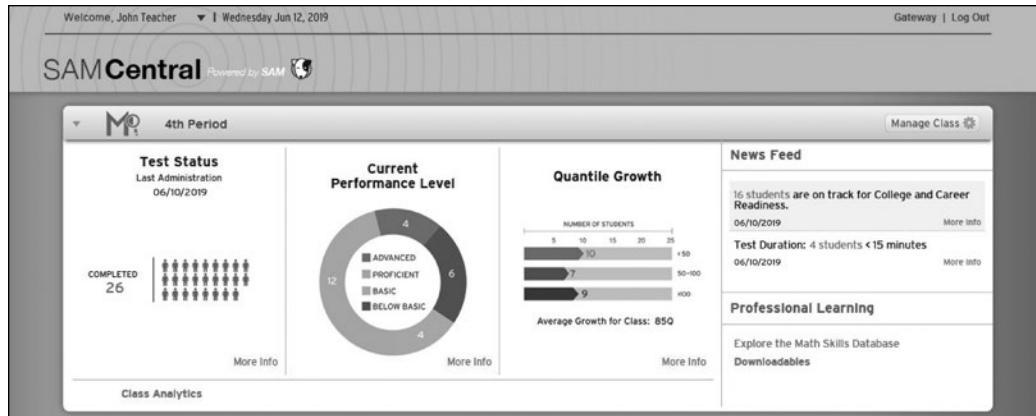
*Two supplemental skills or concepts I will incorporate into my lesson to support the understanding of the selected skill are . . .*

#### IMPENDING SKILLS

*Two impending skills or concepts that extend or challenge students' understanding of the selected QSC are . . .*

# SAM Central | Learning Resources

SAM Central includes embedded professional learning tools to set up best practices for administering the test and analyzing data.

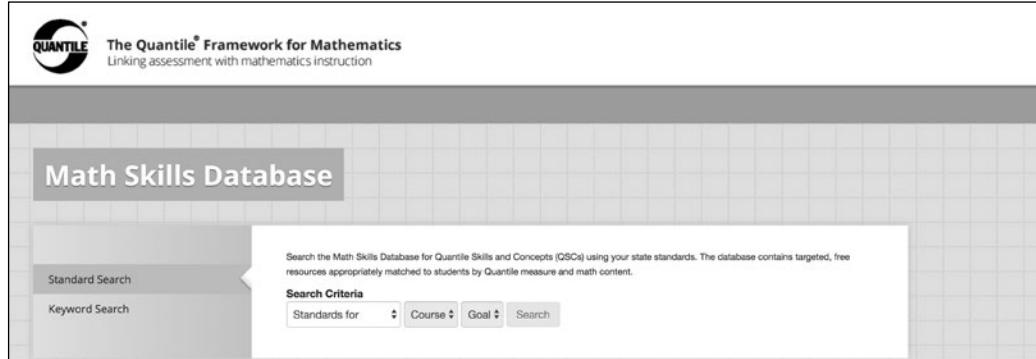


## PROFESSIONAL LEARNING

- Explore the Math Skills Database
- View the Common Core State Standards alignment
- Download support materials

## Learning Resources | Math Skills Database

Use the **Explore the Math Skills Database** link under **Professional Learning** on the SAM Central home screen to help differentiate math content based on students' readiness for instruction and upcoming lessons. It can also be accessed directly from the Quantiles.com website at <https://math-tools.quantiles.com/math-skills-database/>.



The Math Skills Database contains targeted, free resources appropriately matched to students by Quantile measure and math content ([www.quantiles.com](http://www.quantiles.com)). Search the Math Skills Database for Quantile Skills and Concepts (QSCs) in the following two ways:

### STANDARD SEARCH

- Common Core State Standards
- Your state standards

### KEYWORD SEARCH

- Keywords
- QSC ID from *Math Inventory* reports
- Quantile measure from *Math Inventory* reports

### ► REFLECTION

After reading **pages 130–131**, complete the reflection below. Name three resources found in the Math Skills Database.

# Learning Resources | Math Skills Database

The Quantile® Framework for Mathematics  
Linking assessment with mathematics instruction

**Math Skills Database**

Standard Search Keyword Search

Search the Math Skills Database for Quantile Skills and Concepts (QSCs) using keywords, a Quantile measure, or both. The database contains targeted, free resources appropriately matched to students by Quantile measure and math content.

Keywords (or QSC ID, e.g. QSC163 or 163)  
Fractions

Quantile Measure

Strand All Strands

Search

23 skill(s) found

| QSC ID | Quantile Measure | Description   | Strand               |
|--------|------------------|---|----------------------|
| QSC114 | 190Q             | Represent fractions concretely and symbolically, including representing whole numbers as fractions. | Number Sense         |
| QSC538 | 300Q             | Compare fractions with the same numerator or denominator concretely and symbolically.               | Number Sense         |
| QSC540 | 320Q             | Identify combinations of fractions that make one whole.   | Numerical Operations |



**TIP**  
Enter the QSC ID of a recommended QSC for individual instruction from the Progress to College and Career Report.

## Using the Keyword Search

Follow the steps below to use the Keyword Search to compare your students' Quantile measures with the difficulty level of the lesson(s) you plan to teach.

1. Click **Explore the Math Skills Database** under **Professional Learning** on the SAM Central home screen.
2. Select **Keyword Search** and enter keywords such as your grade-level target skill or concept for instruction. Then click **Search**. Results will appear beneath the search fields.
3. Click on the QSC that most closely matches your plans for instruction.

To locate resources appropriate to a student's Quantile measure, replace steps 2 and 3 with the following steps:

2. Select **Keyword Search** and enter a student's Quantile measure instead of a keyword. Choose a strand, if applicable. Then click **Search**. Results will appear beneath the search fields.
3. Click on the QSC that most closely matches your plans for instruction. Then click the **Resources** tab to view associated resources. Or click **Resources** before selecting a QSC to view all resources associated with the Quantile measure.

# Learning Resources | Math Skills Database

## View QSC Details

View the details of the target skill or concept for instruction in order to support planning for differentiated instruction.



**TIP**

Use the Instructional Planning Report to compare the **Quantile Measure** of the target QSC to the Quantile measures of students in your class. Use the Knowledge Cluster to identify QSCs and differentiate instruction accordingly.

The screenshot shows the Quantile Framework for Mathematics website. At the top, there's a logo and the text "The Quantile® Framework for Mathematics" and "Linking assessment with mathematics instruction". Below this is a section titled "Quantile Skill and Concept Details" with a sub-section for QSC115: "Use benchmark numbers (zero, one-half, one) and models to compare and order fractions." This section includes details like QSC ID (QSC115), Quantile Measure (4500), Strand (Number Sense), and Description (Use benchmark numbers (zero, one-half, one) and models to compare and order fractions.).

- 1** **QSC details:** Information displayed includes **QSC ID**, **Quantile Measure**, **Strand**, and **Description**.
- 2** **Knowledge Cluster:** Click to view the **Prerequisite Skills**, **Supporting Skills**, and **Impending Skills** for the selected QSC.
- 3** **Resources:** Click to view **Web**, **Downloadable**, and **Book Periodical Print Resources** to support instruction on the selected QSC.
- 4** **Standards:** View state standards or Common Core standards aligned to your selected instruction.

No state specified. See associated standards for: Common Core

## Use the QSC Details to Plan Instruction

- 1** **QSC details:** Information displayed includes **QSC ID**, **Quantile Measure**, **Strand**, and **Description**.
- 2** **Knowledge Cluster:** Click to view the **Prerequisite Skills**, **Supporting Skills**, and **Impending Skills** for the selected QSC.
- 3** **Resources:** Click to view **Web**, **Downloadable**, and **Book Periodical Print Resources** to support instruction on the selected QSC.
- 4** **Standards:** View state standards or Common Core standards aligned to your selected instruction.

# Learning Resources | Math Skills Database

The screenshot shows a search interface for the Math Skills Database. The search criteria are set to Common Core, Grade 5, and 5.NBT.7: Add, subtract, multiply, and divide decimals. The results table displays six items, each with a QSC ID, QSC Description, Quantile Measure, and Strand.

| State Goal | QSC ID  | QSC Description   | Quantile Measure | Strand               |
|------------|---------|---|------------------|----------------------|
| 5.NBT.7    | QSC05/B | Use the distributive property to represent and simplify numerical expressions.                        | 560Q             | Numerical Operations |
| 5.NBT.7    | QSC15B  | Add and subtract decimals using models and pictures to explain the process and record the results.    | 580Q             | Numerical Operations |
| 5.NBT.7    | QSC1R1  | Use the commutative and associative properties to add or multiply numerical expressions.              | 720Q             | Numerical Operations |
| 5.NBT.7    | QSC201  | Estimate and compute sums and differences with decimals.  | 580Q             | Numerical Operations |
| 5.NBT.7    | QSC608  | Multiply or divide two decimals or a decimal and a whole number in number and word problems.          | 700Q             | Numerical Operations |
| 5.NBT.7    | QSC1022 | Multiply and divide decimals using models and pictures to explain the process and record the results. | 750Q             | Numerical Operations |



## TIP

Enter the QSC ID of a recommended QSC for individual instruction from the Progress to College and Career Report.

## Using the Standard Search

Follow the steps below to identify skills and concepts for instruction that are aligned with Common Core or state standards.

1. Click **Explore the Math Skills Database** under **Professional Learning** on the SAM Central home screen.
2. Select **Standard Search** and enter **Search Criteria** using menus. Click **Search**. Results will appear beneath the search fields.
3. Select a QSC for instruction aligned to your selected standard and use the QSC details to differentiate and support instruction.

To locate resources appropriate to a student's Quantile measure, replace steps 2 and 3 with the following steps:

2. Select **Keyword Search** and enter a student's Quantile measure instead of a keyword. Choose a strand, if applicable. Then click **Search**. Results will appear beneath the search fields.
3. Click on the QSC that most closely matches your plans for instruction. Then click the **Resources** tab to view associated resources. Or click **Resources** before selecting a QSC to view all resources associated with the Quantile measure.

## Learning Resources | Downloadables

Click **Downloadables** under **Professional Learning** to view manuals as well as new supporting research documents as they become available.

The screenshot shows the MI Standalone software interface. On the left, there is a sidebar with several sections: DATA SNAPSHOT (Test Status: COMPLETED 26, Class Analytics, Student Analytics, Run a Report), PROFESSIONAL LEARNING (Explore the Math Skills Database, Downloadables), and MANAGE CLASS (Class Profile). The main area is titled "DOWNLOADABLES". It features a search bar with "Type keyword" and "Search" button, and a browse section with dropdown menus for "Program\*" (set to "Math Inventory") and "Resource Type\*", separated by an "OR" operator. There is also a "Search" button for the browse section.

# Learning Resources | Standards Alignments

## View Common Core State Standards Alignments

View the Common Core State Standards alignment to *Math Inventory* from **Professional Learning** on the SAM Central home screen. Choose Downloadables and then **Assessment** from the **Resource** menu. You can also access this resource from the Quantiles.com website, where both CCSS and other state standards are aligned.

| QUANTILE FRAMEWORK ALIGNMENT TO THE COMMON CORE STATE STANDARDS |   |  |
|---|---|--|
| QSC   | QSC Description   | Common Core State Standard ID            |
| 39  | Recognize the context in which addition or subtraction is appropriate, and write number sentences to solve number or word problems.                       | K.OA.A.1, K.OA.A.2                       |
| 75  | Identify missing addends for addition facts.  | K.OA.A.4                                 |
| 20  | Organize, display, and interpret information in concrete or picture graphs.   | K.MD.B.3                                 |
| 54  | Sort a set of objects in one or more ways; explain.   | K.MD.B.3                                 |
| 14  | Describe, compare and order objects using mathematical vocabulary.  | K.G.A.3, K.MD.A.1, K.MD.A.2              |
| 15  | Use directional and positional words.   | K.G.A.1                                  |
| 16  | Describe likenesses and differences between and among objects.  | K.G.B.4                                  |
| 46  | Identify and name basic solid figures: rectangular prism, cylinder, pyramid, and cone; identify in the environment.                                       | K.G.A.1, K.G.A.2                         |
| 52  | Recognize the 2-dimensional elements of 3-dimensional figures.  | K.G.A.3                                  |
| 536   | Identify, draw, and name basic shapes such as triangles, squares, rectangles, hexagons, and circles.  | K.G.A.1, K.G.A.2, K.G.A.3, K.G.B.5       |
| 537   | Identify and name spheres and cubes.  | K.G.A.1, K.G.A.2, K.G.A.3                |
| 542   | Combine two- and three- dimensional simple figures to create a composite figure.  | K.G.B.6                                  |
| 627   | Use models to determine properties of basic solid figures (slide, stack, and roll).   | K.G.B.4                                  |
| 1002  | Use models and appropriate vocabulary to determine properties of basic plane and solid figures (open or closed, number of sides and vertices or corners). | K.G.B.4                                  |
| 581   | Measure length using nonstandard units.   | K.MD.A.1                                 |
| 582   | Measure weight using nonstandard units.   | K.MD.A.1                                 |
| 583   | Measure capacity using nonstandard units.   | K.MD.A.1                                 |
| 36  | Model the concept of addition for sums to 10.   | K.OA.A.1, K.OA.A.2, K.OA.A.4             |
| 37  | Model the concept of subtraction using numbers less than or equal to 10.  | K.OA.A.1, K.OA.A.2                       |
| 41  | Know and use addition and subtraction facts to 10 and understand the meaning of equality.   | K.OA.A.3, K.OA.A.4, K.OA.A.5             |
| 4   | Read and write numerals using one-to-one correspondence to match sets of 0 to 10.   | K.CC.A.3, K.CC.B.4a, K.CC.B.4b           |
| 7   | Create and identify sets with greater than, less than, or equal number of members by matching.  | K.CC.C.6                                 |
| 24  | Rote count beginning at 1 or at another number by 1s, and rote count by 2s, 5s and 10s to 100 beginning at 2, 5, or 10.                                   | K.CC.A.1, K.CC.A.2                       |
| 25  | Read and write numerals using one-to-one correspondence to match sets of 11 to 100.   | K.CC.A.3, K.CC.B.4a, K.CC.B.4b, K.CC.B.5 |
| 33  | Represent numbers up to 100 in a variety of ways such as tallies, ten frames, and other models.   | K.CC.B.5, K.NBT.A.1                      |
| 35  | Use place value with ones and tens.   | K.NBT.A.1                                |
| 663   | Represent a number in a variety of numerical ways.  | K.NBT.A.1, K.OA.A.3, K.OA.A.4, K.CC.A.3  |
| 1001  | Compare and order sets and numerals up to 20, including using symbol notation ( $>$ , $<$ , $=$ ).  | K.CC.B.4c, K.CC.C.7, K.MD.B.3            |

## Conferencing with Students

When conferencing with students, use the Student Test Printout report, Progress to College and Career Report, and Conference Record to view their tests, celebrate growth, and set goals for math achievement.

**Student Test Printout**

Student: Cooper, Maya

INSTRUCTIONAL PLANNING

Class: 3rd period  
Teacher: Sarah Foster  
Grade: 5

**GROWTH**

**Math Inventory**

Question 1: Luis has  $\frac{1}{2}$  of a yard of fabric that he needs to cut into 4 equally-sized strips. How much fabric can Luis cut for each strip?



Correct Answer: A Student Answer: B Response Time: 10 sec

**Progress to College and Career Report**

STUDENT: Collins, Chris

SCHOOL: Williams Middle School  
Teacher: Sarah Foster  
Grade: 5  
Class: 3rd Period  
Group: Group A  
Time Period: 08/24/18 – 02/22/19

| TEST DATE    | GRADE | ADDITION | MULTI | QUANTILE® MEASURE | PERFORMANCE LEVEL | PERCENTILE RANK |
|--------------|-------|----------|-------|-------------------|-------------------|-----------------|
| 02/22/2019   | 5     | ●        | ●     | 833Q              | ■                 | 90              |
| 12/13/2018   | 5     | ●        | ●     | 766Q              | ■                 | 71              |
| ► 03/04/2019 | 5     | ●        | ●     | 684Q              | ■                 | 46              |

**KEY**

- EM Emerging Mathematician
- ADVANCED
- PROFICIENT
- BASIC
- BELOW BASIC
- INCOMPLETE TESTS
- Test taken in less than 15 minutes
- Student may need to develop this skill
- Student has acquired this skill

Use the above reports to:

- Review test items that the student struggled with and identify challenging skills and concepts for instruction
- Identify Quantile growth since the previous assessment
- Discuss priority skills and concepts with the student to set learning goals
- Complete the student conference record to set and communicate goals for instruction and achievement

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# Conference Record

Student's Name \_\_\_\_\_ Date \_\_\_\_\_

Quantile® Measure \_\_\_\_\_ Subject of Conference \_\_\_\_\_

In our conference we talked about:

Areas of improvement are:

Next math skills and concepts to learn are\*:

Favorite things to do in math:

Comments:

Date to check progress: \_\_\_\_\_

Student \_\_\_\_\_ Teacher \_\_\_\_\_

\*Choose three skills and concepts from the Progress to College and Career Report to target.

## ***Math Inventory Simulator and Practice Tips***

### **The Student Experience**

**DIRECTIONS:** As you complete the *Math Inventory* Simulator experience, record notes. List reminder tips and answer questions.

#### **MATH INVENTORY SCREENERS:**

What do the screeners evaluate? How are they different for Grade 1 or Grade 5 students?

#### **DIRECTIONS:**

How do you change an answer? Can you skip a question?

#### **CALCULATOR AND FORMULAS TIP:**

Click on the formula sheet and write down what you notice:

#### **PRACTICE TEST TIP:**

Practice Test Alert (if a practice question was answered incorrectly):

## **Best Practices**

**DIRECTIONS:** As you learn about teaching with *Math Inventory*, record notes. List reminder tips and answer questions.

#### **BEST PRACTICES FOR ADMINISTERING MI:**

#### **ADAPTIVE TESTING:**

#### **COMPLETING AN MI TEST:**

#### **VIEWING TEST RESULTS:**

# Exploring SAM Central

Use this table to guide your exploration of data analytics and reports on SAM Central.

## SAM Central (Home Screen) *To gain important information, click on **More Info** anytime it appears.*

*Explore each snapshot:*

**Test Status** – How many students completed the test?

**Current Performance Level** – Click to see which students are in each level.

**Quantile Growth** – Click to see which students had the greatest and least quantile growth.

## Class Analytics *Click on **Class Analytics**, in blue, in the bottom left corner.*

*Scroll through all screens of the Current Quantile:*

**Screeners** – Which students need work on their addition facts?

**Performance and Usage** – What are some recommendations for students who took 15 minutes to complete their assessment?

**Normative Data** – What percentage of students scored in the 0–10 percentile range?

*Click on Quantile Growth:*

Which students moved from Below Basic to Basic? What are some recommendations for students that moved from one performance level to another?

## Student Analytics *To gain important information, click on **More Info** anytime it appears.*

*Click on three different student names. Review both tabs for each student.*

**Test History** – Review the test dates and the performance levels.

**Recommendations** – Review the recommended skills and concepts for instruction for each student.











# Notes



hmhco.com  
hmhco.com/mathinventory  
mathsolutions.com



## Our Professional Learning will help you:

- Plan targeted instruction and differentiation using students' Quantile® measures and the Quantile® Framework for mathematics.
- Effectively prepare students and create an environment for online testing to obtain accurate results.
- Interpret *Math Inventory* assessment results to determine students' readiness for math instruction and their progress toward future learning.
- Analyze assessment data to benchmark math progress and differentiate instruction.
- Use online management tools to view data, manage enrollment, customize user experience, and access resources.



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