mCLASS Math

Administration Guide

Amplify.

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CHAPTER 1:

Introduction to mCLASS Math

The mCLASS® Math assessment solution is a groundbreaking, asset-based digital assessment and reporting system that provides new levels of insights about students' math skills and understanding in K–5. This powerful, formative program is based on the best practices in mathematics education, combining screening and progress monitoring tools with rich diagnostic data analysis. The mCLASS math system goes beyond correct and incorrect scoring to reveal the underlying mathematical thinking in student responses to guide targeted intervention. It allows educators to leverage results and actionable data analysis to inform timely instructional decisions, and offers recommendations to support educators' with next steps with resources to assist in instructional planning and differentiated student learning. This guide is a compendium of information about mCLASS Math. It describes the need for assessments that capture mathematical understanding with actionable data, and explains how mCLASS Math meets this need. It includes a description of mCLASS Math, along with details of the development process, instructions for how to administer and score mCLASS Math, and information on how to use mCLASS Math data to inform instructional decision-making.

Computer-Based Assessments and Gaps

Computer-based assessments have revolutionized educational testing by offering a fast, efficient means for evaluating student performance across various subjects. These digital assessments are an integral part of modern classrooms, providing rapid feedback and streamlined administration that supports timely instructional adjustments. However, despite these advantages, significant gaps remain in how computer-based assessments capture a comprehensive picture of student understanding, particularly in mathematics.

Traditional formats using forced-choice questions often emphasize rote memorization and algorithmic procedures, focusing narrowly on basic fact recall. This can result in a failure to assess deeper cognitive skills, such as problem-solving and critical thinking, which are crucial for students' long-term success in mathematics and related fields.

Moreover, the design of traditional computer-based assessments, with their emphasis on correct or incorrect scoring, often results in limited actionable data. The insights generated focus on accuracy, rather than how students solved a problem and arrived at their solution, which can disproportionately impact students from diverse backgrounds (Nichols et al., 2012). Often students who are deemed at risk are categorized as struggling based on assessment data that does little to highlight their thinking, strategies, or what they know; the focus of the assessment is merely on accuracy. This underscores the pressing need for assessment models that are inclusive, comprehensive, and capable of evaluating a broader spectrum of student skills and thinking in real time.

Innovative Features of mCLASS Math

mCLASS Math represents a significant innovation in the landscape of computer-based testing, aiming to bridge the gaps identified in traditional assessment methods. The assessment design is grounded in substantial research in mathematics education, special education, and psychology, identifying skills predictive of future success in mathematics. This emphasis ensures that mCLASS Math not only measures students' grasp of operations, algebraic thinking, and geometry, but also delves into their reasoning, problem-solving, and critical thinking abilities. While other assessments may evaluate the same concepts, the use of open-ended responses allows mCLASS Math to capture and report on student thinking. The format of the assessment design, with emphasis on open-response item types, allows mCLASS Math to go beyond simple recall and procedural knowledge, focusing on the evaluation of essential mathematical concepts as outlined by the Common Core State Standards.

A key distinguishing feature of mCLASS Math is its commitment to uncovering and analyzing students' mathematical thinking. This is achieved through various item types that invite students to demonstrate their reasoning and approaches to problem-solving. The system generates multiple comprehensive reports, such as the Student Thinking Report, which provides a nuanced analysis of student responses, shedding light on the diverse ways students approach solving mathematical problems. Such reports facilitate a deeper understanding of a student's strengths and learning strategies—referred to as their "assets"—thereby empowering teachers to tailor instruction according to each student's unique needs.

By leveraging technological advancements, mCLASS Math provides teachers with timely and actionable data that prioritizes the understanding of students' thinking processes over mere accuracy. This approach supports teachers in offering targeted support within the zone of proximal development (see Vygotsky et al., 1978), bridging gaps between independent student capacities and potential achievements with appropriate guidance. Through its innovative design, mCLASS Math addresses the limitations of traditional assessments, providing an equitable, comprehensive tool that enhances instructional practices and ultimately supports student achievement in mathematics.

Defining mCLASS Math

mCLASS Math is a comprehensive system designed for benchmarking and progress monitoring to support timely instructional decisions throughout the school year. It involves three benchmarking administration periods combined with frequent formative progress monitoring assessments, ensuring robust support for student learning. The assessment uses empirically established cut points that predict end-of-year outcomes and help identify students needing additional support, specifically those in need of Tier 2 and Tier 3 instruction.

This research-based assessment is validated for identifying students at risk for mathematical difficulties, including dyscalculia. By focusing on the major work of each grade level, mCLASS Math assesses essential math skills from kindergarten through fifth grade, covering such areas as counting and cardinality, algebraic thinking, number operations, fractions, measurement, data analysis, and geometry.

The system leverages innovative data analysis and reporting tools to explore the mathematical thinking reflected in student responses. This diagnostic approach offers detailed insights into student skills and knowledge, allowing educators to tailor instruction more effectively.

As a universal screener for math and dyscalculia, mCLASS Math provides immediate results and diagnostic analysis, complete with instructional recommendations and resources for both small-group and individual support. The group-administered digital assessment, requiring about 20–30 minutes, empowers educators with automated scoring and analysis to help make better informed instructional decisions.

Performance levels are determined through established cut scores that predict end-of-year success. These levels identify students who are above benchmark, at benchmark, below benchmark, and well-below benchmark, guiding appropriate instructional support for intervention and enrichment. Students scoring below benchmark can benefit from strategic Tier 2 support, whereas those well-below benchmark may require intensive interventions.

The mCLASS Math reporting and analysis tools offer targeted instructional recommendations and resources to support varying needs of all students. For students needing intervention, Progress Monitoring assessments are available, providing brief, domain-specific measures that align with instructional goals. This additional 15-minute monitoring ensures that instruction remains responsive and effective between regular screening periods.

Appropriate Uses of mCLASS Math

mCLASS Math was designed to be used from the beginning of kindergarten through the end of fifth grade.

The mCLASS Math assessment was developed and researched as an indicator of risk and progress in overall mathematics, as well as an indicator of risk for dyscalculia and other math difficulties. mCLASS Math has three principal uses: (1) to identify students who may be at risk of math difficulties up to three times per year, (2) to progress monitor those students identified as at risk of math difficulties, and (3) to establish minimum levels of performance through benchmark goals throughout the year to be considered on track for meeting grade-level expectations. mCLASS Math benchmarks were validated as screening measures administered at the beginning, middle, and end of a school year.

Additional forms are available for progress monitoring. During the 2025–26 school year, Amplify will be conducting a study to validate the equivalency of alternate forms for progress monitoring.

CHAPTER 2:

Integrated Assessment System

Overview of Benchmark Assessments

Benchmark Assessments

mCLASS Benchmark Assessments are designed for the purpose of universal screening three times a year (at the beginning, middle, and end of the year) to evaluate student performance against grade-level expectations that are determined by empirically established cut scores that are valid, reliable, and predictive of later outcomes.

Assessment Format and Item Types

mCLASS Benchmark Assessments are digital assessments and consist of up to 25 items for grades K–2 and up to 34 items for grades 3–5. mCLASS Math assessments are digitally assigned by the teacher or co-teacher to the whole class. Once the assessments are assigned, Once the assessment is assigned, students see it on their Home screen to launch it themselves.

The assessments include a range of item types that are best suited for the concepts and skills being measured. The items include constructed response, multiple choice, sorting, drag/drop, and other tech-enhanced item types that reflect state test formats. mCLASS Math assessment items also provide digital tools and manipulatives with which students can interact for problem solving. Teachers have access to student work using digital tools for additional information.

The assessments take about 30 minutes for the whole class, which includes the time for automated scoring and data analysis that enable immediate reporting and recommendations, letting teachers take action promptly. mCLASS Math automatically scores the assessments; its state-of-the-art analysis engine is able to examine student responses to identify valid math thinking in ways that go beyond correct or incorrect scoring. These insights are surfaced automatically in the Student Thinking reporting and drive the instructional grouping and recommendations to support targeted intervention.

Domains Coverage

mCLASS Math is designed to evaluate concepts and skills that are essential and predictive of students' success in mathematics in the following domains:

Domains by Grade Level

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Counting & Cardinality	Counting & Cardinality				
Algebraic Thinking	Algebraic Thinking	Algebraic Thinking	Algebraic Thinking	Algebraic Thinking	Algebraic Thinking
Number & Operations	Number & Operations	Number & Operations	Number & Operations	Number & Operations	Number & Operations
			Fractions	Fractions	Fractions
Measurement & Data	Measurement & Data	Measurement & Data	Measurement & Data	Measurement & Data	Measurement & Data
Geometry	Geometry	Geometry	Geometry	Geometry	Geometry

Understanding Performance Levels

Benchmark Performance Levels

mCLASS Math features criterion-referenced design that supports objective comparison of student performance across schools, districts, and states. Assessments can be administered multiple times throughout the year and support use across different grade levels.

Based on the research and normative samples, mCLASS Math calculates a Composite Score, or overall risk score. Cut scores are then used to determine a predictive risk level for each skill, as well as overall math proficiency. The scores sort the results into four status categories: Above Benchmark, At Benchmark, Below Benchmark, and Well-Below Benchmark. The empirically established cut scores represent four levels of performance that are predictive of end-of-year outcomes.

Using these levels, educators can determine where to extend efforts in supporting individual students and the whole class. The cut points identify students whose scores above benchmark and could benefit from enrichment, as well as those whose scores are well-below benchmark and who are in need of intensive intervention support. Scores within the At Benchmark level indicate minimal risk, and core instruction should keep these students on track toward meeting end-of-year grade-level expectations. Students whose scores fall within the Below Benchmark performance level could benefit from strategic support (for instance, Tier 2 instruction) beyond the core instruction.

Benchmark status implications

Benchmark Status	Instructional Implication
Above Benchmark (Blue)	Students with scores in the Above Benchmark range are at negligible risk for not meeting grade-level expectations and are at the least risk in math. Students performing above this cut score are very likely in need of only core support, meaning the general curriculum should serve these children well. Students performing above benchmark may benefit from instruction on more advanced skills.
Benchmark (Green)	Students with scores in the At Benchmark range are at minimal risk for math difficulty and on track for meeting grade-level expectations. They likely need only core support to meet grade-level proficiency goals, meaning the general curriculum should serve these students well.
Below Benchmark (Yellow)	Students with scores in the Below Benchmark range are at some risk for not meeting grade-level expectations. They likely need strategic instructional support to meet grade-level expectations.
Well Below Benchmark (Red)	Students with scores in the Well Below Benchmark range are at risk for math difficulties, including dyscalculia. They likely need intensive instructional support to meet grade-level expectations.

Domain Performance Levels

Domain performance levels are informed by the same ability cut points as the overall assessment. The benchmark status appears for each domain separately. This information allows educators to identify the specific area that needs the most help to inform instructional decisions. For example, two students may both have Below Benchmark scores, but their individual domain level indicators may suggest different areas of need. The mCLASS Classroom Benchmark report provides performance levels, risk status, and color coding by domain and composite score.

Dyscalculia Screening and the mCLASS Assessment

mCLASS Math is a versatile tool designed to function as both a universal and dyscalculia screener, strategically identifying students at risk for math challenges, including potential dyscalculia. Validated for this dual function, it provides critical data to inform early intervention efforts without the need for separate testing.

This does not substitute for a formal diagnosis, but rather provides critical data to inform early intervention efforts and educational planning, by highlighting areas of difficulty in students' mathematical understanding.

Understanding the Characteristics of Dyscalculia

Dyscalculia is a learning disability that affects 3–7% of school-aged students and significantly affects their ability to grasp and manipulate numbers (Rubinsten & Henik, 2009). In the early grades, signs of dyscalculia often manifest as difficulties with number sense—such as counting and recognizing numbers—and basic arithmetic operations, including addition, subtraction, multiplication, and division.

Students with dyscalculia may struggle with:

- Number sense: Difficulty counting objects, comparing quantities, and recognizing larger one-digit numbers (Butterworth, et al., 2011; Geary, 2011).
- Subitizing: Slower ability to quickly recognize sets of one to four objects (Schleifer & Landerl, 2011).
- Basic arithmetic: Delays in developing automaticity with single-digit calculations and reliance on inefficient strategies (Jordan & Montani, 1997).
- Place value and estimation: Challenges in understanding place value and performing accurate number approximation (Chan & Ho, 2010; Geary, et al., 2008).

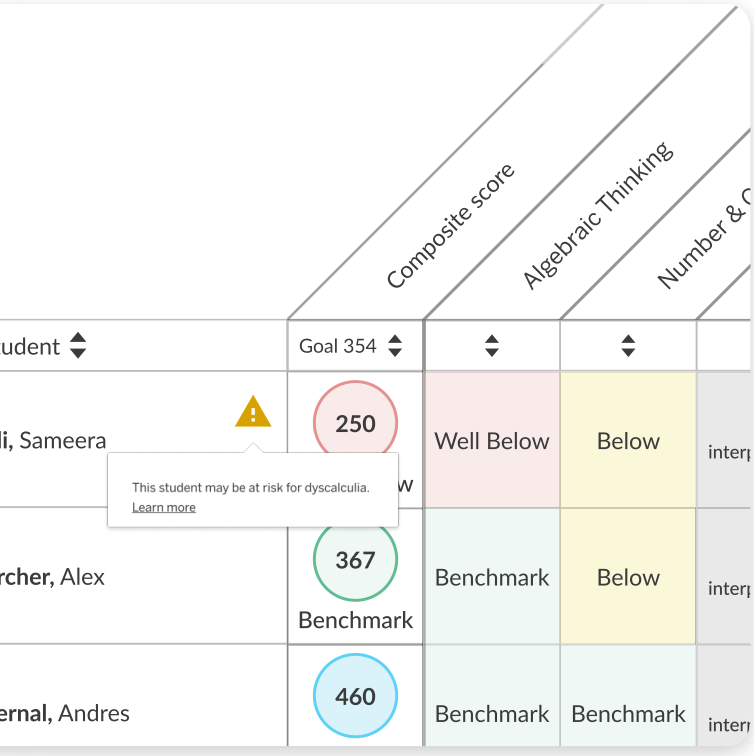
Identifying Risk With mCLASS Math

In kindergarten through grade 3, mCLASS Math evaluates skills closely tied to dyscalculia, such as number sense and foundational arithmetic operations. It also considers difficulties with place value, estimation, and number approximation, like accurately placing numbers on a line.

It is crucial to understand that in the context of screening, "risk" refers to the likelihood that a student may encounter significant difficulties in mathematics, indicative of potential dyscalculia, but it does not amount to a formal diagnosis. The purpose of identifying risk through mCLASS Math is to guide educators in planning early intervention strategies, helping to ensure that students receive the support they need at an early stage.

Early Intervention and Educational Planning

mCLASS Math helps flag students at risk, enabling educators to initiate early interventions essential for building foundational numeracy skills. When educators can identify these risks early, in kindergarten through third grade, they have the opportunity to intervene and address crucial numeracy skills before they become deeply ingrained issues (Monei & Pedro, 2017; Wilson et al., 2015). Interventions focus on building foundational numeracy and arithmetic skills, which are vital for achieving educational milestones and meeting grade-level standards, such as those in the Common Core State Standards for Mathematics.



Developing and Utilizing the for the Potential Risk of Dyscalculia Flag

The mCLASS Math "risk" flag was developed based on research into early numeracy skills and common characteristics of dyscalculia. These include deficits in number sense and arithmetic operations that are critical during foundational learning years (National Council of Teachers of Mathematics, 2020). Students flagged “at-risk” typically score well below expected levels in composite assessments and require further evaluation to confirm any learning difficulties. The flagging system aims to identify those who may benefit from additional support or follow-up testing for more comprehensive evaluation.

By using mCLASS Math for screening, educators have an efficient way to flag risk and guide intervention strategies for the students who need them most, helping to foster educational success from the earliest stages of learning. Educators using mCLASS Math to comply with dyscalculia screening guidelines, are advised to follow state-specific criteria to ensure comprehensive educational support.

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Progress Monitoring Assessments

For students whose scores are below grade level and who are in need of intervention support, mCLASS Progress Monitoring (PM) assessments provide frequent monitoring between screening periods to inform adjustments to instruction. Teachers assign the domain-specific PM form that aligns with the target of the instructional area. The fall PM forms are administered between the BOY and MOY benchmark assessment periods, and the spring PM forms are administered between the MOY and EOY benchmark assessment periods. This 15-minute assessment for progress monitoring provides domain-specific measures that are brief and align with the target of instructional support.

Instructional Resources

mCLASS Math includes resources for small-group and individual student instruction that align with the daily lessons of major core programs. The resources are mapped to the instructional groups identified based on assessment results, as well as aligned to the lessons of the enacted core program by topic.

These resources include:

- Mini-Lessons: 15-minute, teacher-led intervention lessons aligned to the key topics of the major core curriculum.
- Centers: student-led, small-group activities and games for students to play collaboratively, providing active problem-solving experiences that promote conceptual understanding and procedural fluency.
- Extensions: Ten- to 15-minute activities for targeted, hands-on enrichment for the whole class or for small groups of students ready for an extra challenge.
- Math Adventures: strategy-based digital math games that provide students a fun, engaging, and low-stakes way of practicing math skills. Math Adventures are perfect for times when teachers need students to be independent after finishing classwork, an assessment, or group work.
- Fluency Practice: an evidence-based approach to memory retention—spaced repetition (e.g., Rittle-Johnson & Koedinger, 2009), which helps free up brainpower and working memory for students to do more complex mathematical work. The adaptive nature of spaced repetition allows students to focus less and less on the facts they already know. This approach builds fluency, providing further opportunities for students to reach mathematical proficiency. We recommend that students spend five to 10 minutes practicing every day.

CHAPTER 3:

Development of mCLASS Math

Assessment Design

mCLASS Math consists of three benchmark assessments for each grade level. These benchmark forms are designed to be implemented at the beginning of year (BOY), middle of year (MOY), and end of year (EOY). Each assessment includes 20–34 items, depending on the grade level. Grades K–1 include up to 21 items; Grade 2 includes up to 26 items; and Grades 3–5 include up to 34 items. All benchmark assessments are group-administered and take students 20–30 minutes to complete.

Number of items per time of year and grade

	BOY	MOY	EOY
Kindergarten	20	21	25
Grade 1	20	22	21
Grade 2	25	26	26
Grade 3	32	33	34
Grade 4	31	32	33
Grade 5	31	32	32

Each benchmark contains at least one item from each domain; content areas align with state standards and directly address the essential math strands for each grade level in Grades K–5. The number of items per domain varies, reflecting the emphasis placed on certain concepts and skills at different times of year. Prioritization is given to concepts and skills emphasized in the major and supporting clusters identified by Achieve the Core (Achieve the Core, n.d.; Common Core State Standards for Mathematics, 2010; NAEP, n.d.; TIMSS, n.d.).

Number of items by time of year and domain

Grade K	BOY	MOY	EOY
Counting & Cardinality	8	7	8
Algebraic Thinking	6	7	8
Number & Operations		1	2
Measurement & Data	3	3	3
Geometry	3	3	3
Total Items	20	21	24
Grade 1	**BOY**	**MOY**	**EOY**
Counting & Cardinality	1		
Algebraic Thinking	7	7	7
Number & Operations	5	7	7
Measurement & Data	5	5	5
Geometry	2	2	2
Total Items	20	21	21
Grade 2	**BOY**	**MOY**	**EOY**
Algebraic Thinking	9	7	7
Number & Operations	7	8	8
Measurement & Data	7	8	8
Geometry	2	3	3
Total Items	25	26	26

Grade 3	BOY	MOY	EOY
Algebraic Thinking	8*	10*	10*
Number & Operations	10	5	5
Fractions	1	5	6
Measurement & Data	7	9	10
Geometry	4	2	2
Total Items	30	31	33
Grade 4	**BOY**	**MOY**	**EOY**
Algebraic Thinking	7*	6*	6*
Number & Operations	8	7	7
Fractions	7	7	8
Measurement & Data	6	7	8
Geometry	2	3	3
Total Items	30	30	32
Grade 5	**BOY**	**MOY**	**EOY**
Algebraic Thinking	3*	3	3
Number & Operations	9	10*	10*
Fractions	9	7	7
Measurement & Data	7	7	7
Geometry	2	3	4
Total Items	30	30	31

*Domain includes one communication item.

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A distinguishing feature in the design of the BOY benchmarks is the accessibility of content in relation to the major work of each grade. The BOY collection of items includes a thoughtful combination of grade-level content, which serves as a baseline and growth measure throughout the year, as well as securely held content which, while solidly connected to that major work, is accessible utilizing understanding from the previous grade. This design is imperative to ensuring that students have access to the mathematics of the benchmark; it also provides teachers with valuable insights into how students are approaching key concepts. Understanding the tools and strategies students are carrying with them as they rise from one grade to the next helps inform instruction as more complex grade-level concepts are introduced.

The content for MOY and EOY benchmarks centers on the essential grade-level concepts and skills, or major work of the grade, including content that is new to the grade level (e.g., fractions in Grade 3; volume in Grade 5). Both MOY and EOY benchmarks assess the same concepts and skills, though the contexts and quantities differ. Data from all three benchmarks is designed to support teachers in making efficient and effective instructional choices, as well as to monitor progress and mathematical growth over the course of the school year.

List of mCLASS Math essential math ideas by grade

Grade K		
Domain	**Essential Math**	**Concept/Skill**
Counting & Cardinality	Number Sense	Enumeration
		Number Sequence
		Magnitude Comparison
Algebraic Thinking	Composition of Numbers	Making 10
	Early Algebraic Thinking	Equivalence
	Whole Number Operations	Whole Number Addition
		Whole Number Subtraction
Measurement & Data	Measurable Attributes	Measurable Attributes
	Data Classification	Data Classification
Geometry	Properties & Attributes of Shapes	Properties & Attributes of 2D Shapes
	Shape Composition	2D & 3D Composite Figures
Grade 1		
Domain	**Essential Math**	**Concept/Skill**
Counting & Cardinality	Number Sense	Enumeration
Algebraic Thinking	Early Algebraic Thinking	Equivalence
	Whole Number Operations	Whole Number Addition
		Whole Number Subtraction
Number & Operations	Place Value	Composing & Decomposing Numbers
		Numerical Comparison
	Whole Number Operations	Whole Number Addition
Measurement & Data	Length Measurement	Estimating & Measuring Length
	Representing & Interpreting Data	Interpreting Categorical Data

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Geometry	Properties & Attributes of Shapes	Properties & Attributes of 2D Shapes
	Shape Composition	2D & 3D Composite Figures
Grade 2		
Domain	**Essential Math**	**Concept/Skill**
Algebraic Thinking	Early Algebraic Thinking	Equivalence
	Whole Number Operations	Whole Number Addition
		Whole Number Subtraction
Number & Operations	Place Value	Base Ten Place Value
		Numerical Comparison
	Number Sense	Number Sequence
	Whole Number Operations	Whole Number Addition
Measurement & Data	Length Measurement	Estimating & Measuring Length
	Representing & Interpreting Data	Interpreting Categorical Data
	Time & Money	Time
Geometry	Properties & Attributes of Shapes	Properties & Attributes of 2D Shapes
	Shape Composition	Equal Partitioning

Grade 3		
Domain	**Essential Math**	**Concept/Skill**
Algebraic Thinking	Early Algebraic Thinking	Equivalence
	Whole Number Operations	Whole Number Addition
		Whole Number Subtraction
		Whole Number Multiplication
		Multi-Step Problems
Number & Operations	Place Value	Base Ten Place Value
		Composing & Decomposing Numbers
		Numerical Comparison
		Rounding
	Number Sense	Number Sequence
	Whole Number Operations	Whole Number Addition
		Whole Number Subtraction
Fractions	Number Sense	Fraction Representations
Measurement & Data	Area Measurement	Estimating & Measuring Area
	Length Measurement	Estimating & Measuring Length
	Representing & Interpreting Data	Representing Categorical Data
		Interpreting Categorical Data
	Time & Money	Time
Geometry	Properties & Attributes of Shapes	Properties & Attributes of 2D Shapes
	Shape Composition	Equal Partitioning

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Grade 4		
Domain	**Essential Math**	**Concept/Skill**
Algebraic Thinking	Early Algebraic Thinking	Equivalence
	Whole Number Operations	Whole Number Multiplication
		Whole Number Division
		Multi-Step Problems
Number & Operations	Place Value	Base Ten Place Value
		Numerical Comparison
	Number Sense	Number Sequence
	Whole Number Operations	Whole Number Addition
		Whole Number Subtraction
		Whole Number Multiplication
		Whole Number Division
Fractions	Fraction Equivalence	Fractions Equivalent to Fractions
	Fraction Operations	Fraction Addition
	Number Sense	Fraction Representations
	Numerical Comparison	Fraction Comparison
Measurement & Data	Area Measurement	Area Calculations
	Contextual Measurement Problems	Contextual Measurement Problems
	Length Measurement	Estimating & Measuring Length
	Measurement Conversion	U.S. Customary Conversions
	Representing & Interpreting Data	Interpreting Quantitative Data
Geometry	Properties & Attributes of Shapes	Properties & Attributes of 2D Shapes

Grade 5		
Domain	**Essential Math**	**Concept/Skill**
Algebraic Thinking	Numerical Expressions	Evaluating Numerical Expressions
		Writing & Interpreting Numerical Expressions
	Whole Number Operations	Whole Number Division
Number & Operations	Place Value	Base Ten Place Value
		Numerical Comparison
		Rounding
	Whole Number Operations	Whole Number Addition
		Whole Number Multiplication
		Whole Number Division
Fractions	Fraction Equivalence	Fractions Equivalent to Fractions
	Fraction Operations	Fraction Addition
		Fraction Multiplication
	Number Sense	Fraction Representations
		Fraction Sense
	Numerical Comparison	Fraction Comparison
Measurement & Data	Contextual Measurement Problems	Contextual Measurement Problems
	Measurement Conversion	Metric Conversions
		U.S. Customary Conversions
	Representing & Interpreting Data	Interpreting Quantitative Data
	Volume Measurement	Volume Calculations
Geometry	Properties & Attributes of Shapes	Properties & Attributes of 1D Objects
		Properties & Attributes of 2D Shapes

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In addition, anchor items are included in each benchmark assessment. Anchor items are identical items that appear across all three benchmark forms. The items target grade-specific content and represent about 25% of the items within each form. The purpose of anchor items is threefold: 1) to measure growth by examining changes in students' performance; 2) to equate different forms of the assessment; and 3) to provide a baseline comparison between different forms across the year.

Creation of Assessment Content

mCLASS Math item development occurred in four phases, each described in more detail below. In Phase 1, the mathematics concepts and skills to include in the assessment were identified. In Phase 2, assessment targets for each benchmark form in each grade level were outlined. In Phase 3, item specifications for each assessment target were generated. In Phase 4, a team of item writers developed the assessment items.

Phase 1

In Phase 1, the research team, along with mathematics content experts, extensively reviewed a variety of resources to identify the mathematics concepts and skills to include in the assessment. The resources reviewed during this phase included, but were not limited to:

- Achieve the Core: Focus by Grade Level
- Common Core State Standards for Mathematics (CCSS-M)
- National Council of Teachers of Mathematics (NCTM)
- National Assessment of Education Progress (NAEP)
- Trends in International Mathematics and Science Study (TIMSS)
- High-impact academic journals (e.g., *Journal for Research in Mathematics Education, ZDM – Mathematics Education, Journal of Educational Psychology, Assessment for Effective Intervention*), practitioner journals (e.g., Mathematics Teacher: Learning and Teaching PK–12), published books (e.g., *Cognitively Guided Instruction* [Carpenter et al., 2015] and *Learning and Teaching Early Math: The Learning Trajectories Approach* [Clements & Sarama, 2021]), and research from prolific researchers (e.g., Maria Blanton, Jo Boaler, Douglas Clements, Nancy C. Jordan, Bethany Rittle-Johnson, Robert S. Siegler, Margaret Smith, Mary Kay Stein).

This review yielded a comprehensive list of 129 concepts and skills, which were considered foundational and/or predictive of students' future success in mathematics.

Phase 2

Using the comprehensive list of concepts and skills identified in Phase 1, the research team and content experts met to collapse this list into broad essential math ideas. Essential math refers to the concepts (e.g., number sense, place value) and skills (e.g., adding within 100 using strategies based on properties of operations; interpreting categorical data) that mCLASS Math is designed to measure in each grade level. Iterative conversations took place as the team worked to revise and refine this list until consensus was reached. A total of 56 essential math topics were identified. The number of essential math ideas varied by grade, ranging from nine to 15 for each grade.

Next, the concepts and skills, along with the essential math ideas, were organized in a blueprint, which were mapped to one grade-level domain.

Essential math concepts and skills were then categorized and sequenced based on appropriateness for time of year. The Beginning-of-Year Benchmark utilizes math concepts from previous grades to properly identity if students are ready for on-grade level work. All mCLASS Benchmark Assessments contain items that are used to monitor progress and track changes in understanding throughout the school year. The MOY and EOY consist of concepts and skills for which students are expected to demonstrate mastery by that time of year. This structured approach ensures that assessments are aligned with educational goals and provide valuable insights into student progress.

Phase 3

A team of mathematics educators, researchers, and content experts reviewed the essential math ideas and identified item specifications for each corresponding concept or skill listed. The following specifications were added to the blueprint.

1. Assessment Target: the definition of what the item will evaluate.
2. Target Quantity: the quantities or range of quantities that will be used in an item, as well as any symbols (e.g., variable, equal sign, greater than, less than) used.
3. Set of Descriptors: a description of the text, images, shapes, measurement units, and/or tables or graphs that will be present in an item. This also includes details on the structural arrangement and placement of these elements (e.g., in an array with three rows and four objects in each row). These elements needed to be engaging and contextually relevant across all grade levels.
4. Next Navigation: the actions students must take to progress to the subsequent item.
5. Item Type: item types vary by grade level. The design of kindergarten–grade 2 items include multiple choice, constructed response, and click to place. The design of grades 3–5 items include multiple choice, constructed response, written explanations, and drag and drop.
6. Distractors: common error patterns or misconceptions related to the assessment target that could be used as a distractors in multiple choice or multi-select item types.
7. Ways of Thinking: anticipated student responses to items, including multiple ways of problem solving.
8. Scoring: the points allocated to each item.
9. Grade-Level Standard: the associated Common Core State Standard for Mathematics.

The team began with kindergarten and worked through each subsequent grade level. Item specifications were reviewed and revised until consensus was reached.

The table below outlines the item specifications used to develop a grade 1 item targeting students' understanding of equivalence. The writer used these specifications to create an item to assess this concept.

Item specifications for a grade 1 concept

Assessment Target	Solve a Put Together, Total Unknown problem from a representation of a categorical data set.
Target Quantity	Within 20
Set of Descriptors	Up to four categories; categories are represented by pictures. Objects are easily countable (e.g., sticky notes); categories do not have the same number of objects.
Next Navigation	Student fills in blank with response before moving to the next item.
Item Type	Math input
Distractors	n/a
Scoring	One point for the correct response (11 single value, with equation); zero points for incorrect responses
Grade-level Standard	1.MD.C.4: Organize, represent, and interpret data with up to three categories: ask and answer questions about the total number of data points, state how many in each category, and understand how many more or less are in one category than in another.

Phase 4

In this final phase, a team of five item writers developed the mCLASS Math assessment items. Each item writer was assigned one grade level, with the exception of one item writer who was assigned two. These writers were responsible for creating two forms (Form A and Form B). Each form contained 20–30 items. These forms included items that represented grade-level content that would be taught across the entire academic school year. Three additional consultants worked with the item writers and collaborated across grade levels. The writers possessed content-area expertise and had extensive elementary classroom experience and/or research experience in elementary mathematics education at the doctoral level.

The item writers used the blueprint to develop items in accordance with the item specifications. The writers were provided various resources to support them in developing the items. For instance, writers were encouraged to review items from standardized tests (e.g., Texas TEA STAAR items, Smarter Balanced Assessment Consortium items), mathematics education textbooks, and scholarly journal articles. See Figure 1 for the item developed according to item specifications.

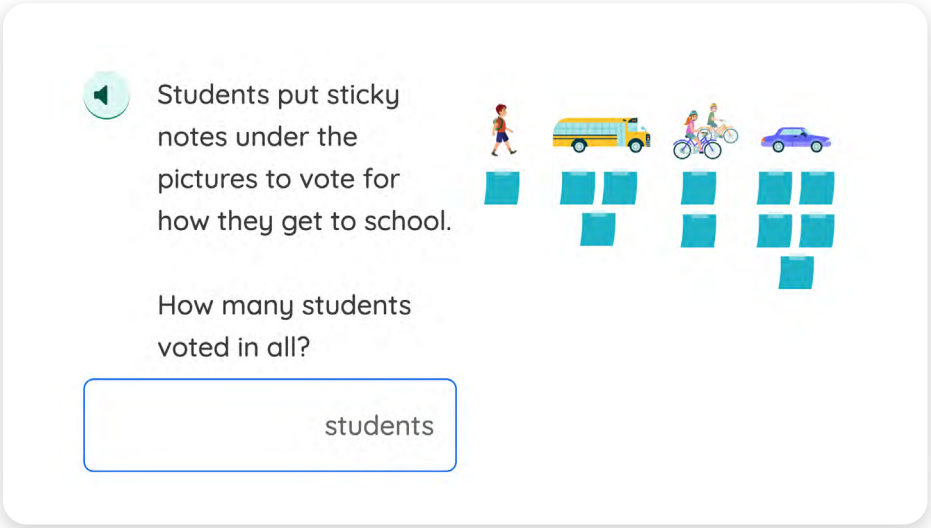

Figure 1. Grade 1 item designed using item specifications

For each item, the writers drafted a visual representation of how they envisioned the item on a Google Slide. They outlined the following information on the slide: domain, assessment target, concept/skill, and Common Core State Standard for Mathematics. Each week, item writers met with internal and external mathematics content experts to review, revise, and refine the items. These meetings were to ensure that the item met the item specification criteria, demonstrated face validity, and elicited student thinking in a way that would provide actionable data for teachers. These meetings were also used to discuss the functionality of each item and the feasibility of its design.

During these meetings, collision checks were performed to help establish clear and instructionally useful assessment items. After designing an item, the content writing team discussed anticipated student responses, both correct and incorrect, to ensure the item elicited multiple ways of thinking. For example, if an item asks students to determine the area of a rectangle with dimensions six inches long and three inches wide, it is difficult to determine whether the student understands the concept of area, because calculating perimeter would elicit the same correct response. Designing items that avoid such collisions helps teachers understand the complex nature of students' mathematical thinking and take meaningful action that supports students' learning of the target concept or skill.

In the next step of the process, all items were placed in a visual flow chart, organized by domain, and further broken down by assessment target. The team continued to meet weekly to review the alignment between items and across grade levels. An important part of this process was to create a balance between BOY, MOY, and EOY items to gather meaningful information about what students know, and to be able to track growth across the school year. During this time, items were categorized as 1) BOY only (items connected to the major work of the current grade level, yet accessible utilizing knowledge acquired from the previous grade), 2) BOY/MOY/EOY (items used to track changes across the school year) or 3) MOY/EOY (concepts and skills for which students are expected to demonstrate mastery by MOY or EOY). Once the items were developed and assigned to their respective Time of Year (TOY) category, an equal number of items from each category was distributed between Form A and Form B. For instance, if there were 10 BOY-only items, five were placed on Form A and five on Form B, ensuring that each form contained a balanced range of items from easy to hard. After all items were finalized, the final step of item calibration was started.

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Number of items by time of year and domain

Grade K	BOY	EOY
Counting & Cardinality	16	9
Algebraic Thinking	19	15
Numbers & Operations	7	2
Measurement & Data	7	2
Geometry	8	3
Total Items	57	31
Grade 1	**BOY**	**EOY**
Counting & Cardinality	3	1
Algebraic Thinking	23	18
Numbers & Operations	20	14
Measurement & Data	10	4
Geometry	11	5
Total Items	67	42
Grade 2	**BOY**	**EOY**
Algebraic Thinking	27	21
Numbers & Operations	17	15
Measurement & Data	13	5
Geometry	6	7
Total Items	69	55

Grade 3	BOY	EOY
Algebraic Thinking	29	24
Numbers & Operations	9	9
Fractions	16	6
Measurement & Data	15	12
Geometry	3	4
Total Items	72	55
Grade 4	**BOY**	**EOY**
Algebraic Thinking	N/A	5
Numbers & Operations	N/A	21
Fractions	N/A	16
Measurement & Data	N/A	10
Geometry	N/A	3
Total Items		55
Grade 5	**BOY**	**EOY**
Algebraic Thinking	N/A	7
Numbers & Operations	N/A	17
Fractions	N/A	19
Measurement & Data	N/A	10
Geometry	N/A	5
Total Items		58

It's important to note that while identifying the Common Core State Standard for Mathematics was part of the process, the benchmark assessments do not provide full standards coverage. Alignment to the standards will be used for reporting purposes, so teachers can make connections among the assessment items, student data, and their own curriculum and instruction.

Item Calibration Study

The Item Calibration (IC) Study was the final step in developing the mCLASS Math Benchmark assessments. During the 2023–24 school year, this study examined the quality of all K–3 items at the BOY and K–5 items at the EOY. The sample included 2,459 students in grades K–5. The EOY results were used to develop alternate, equivalent benchmark forms for grades K–5 for use at beginning, middle, and end of year. This helped ensure that the items on each benchmark form were developmentally appropriate and aligned with the expected progression of students' mathematical knowledge and skills at each respective point in the school year.

Classical test theory (CTT), item response theory (IRT), and differential item functioning (DIF) were employed to provide information on how each individual item functioned, the level of difficulty, and whether the items discriminated between students of varying performance levels. The following research questions were examined:

1. To what extent do items exhibit appropriate difficulty levels for their respective grades? What is the overall distribution of item difficulty within each grade?
2. How effective is each item in distinguishing between distinguishing between students who scored above grade level and those who scored below grade level? How does item performance vary among students with different levels of achievement?
3. Does each item show differential item functioning (DIF)? How does item difficulty vary among specified groups of students (e.g., of the same ethnicity or gender) with equivalent performance levels?

The first research question examined the extent to which items exhibited appropriate difficulty levels for their respective grades and the overall distribution of item difficulty within each grade as measured by the p-value. The results show the majority of K–5 items exhibited appropriate difficulty levels ($0.2 < \text{p-value} < 0.9$) at BOY and EOY (63.0%–80.3% at BOY and 80.0%–98.2% at EOY). The higher grade levels (grades 2 and 3 at BOY and grades 4 and 5 at EOY) had a higher proportion of items flagged as difficult. Between BOY and EOY, the proportion of items flagged as difficult across grades K–3 decreased substantially following revisions by internal and external content experts. The proportion of items flagged as easy increased from BOY to EOY (1.5% at BOY, 3.2%– 8.3% at EOY); however, the proportion of easy items at EOY remained small. In addition, item response theory (IRT) was used to calibrate the items. This allowed difficulty estimates of the items to be placed on a common scale. These results aligned with the p-value statistics, indicating that the majority of items were neither too easy nor too difficult.

The second research question examined how effective each item was in distinguishing between high-performing and low-performing scores and the variation in item performance among students with different levels of achievement. The ability of an item to discriminate between high- and low-performing scores was evaluated with the point-biserial correlation between the item score and the sum of the remaining item scores. Higher point-biserial correlation values indicate that the item does a better job of discriminating between high- and low-performing students. At BOY and EOY, the findings demonstrate that the majority of items distinguished between high-performing and low-performing scores well (75.0%–90.9% at BOY and 90.3%–97.9% at EOY). There was a slightly higher proportion of items that received biserial flags in grades 2 and 3 at BOY, but not at EOY. Again, the proportion of items flagged as discriminating poorly between students with different performance levels decreased substantially after the items underwent revisions between BOY and EOY. Any items that received difficulty or biserial flags were revised and re-reviewed by internal and external content experts.

The third research question identified whether each item displayed differential item functioning (DIF) and how the item difficulty varied among specified groups of students with equivalent performance levels. Overall, most K–2 items did not indicate DIF at BOY or EOY. The proportion of items with little to no indication of DIF was similar in regards to gender (male/female) and race (white/other). At BOY, 1.7%–6.5% of items exhibited Category C DIF. For the purposes of this analysis, items classified as Category C displayed significant DIF and were rejected or flagged for review. This range remained similar at EOY, in which 2.2%–4.2% of items exhibited Category C DIF. Items in grades 3–5 were not evaluated for DIF because the sample sizes were too small, potentially providing insufficient information to reliably identify items with differing functions.

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CHAPTER 4:

Scoring System of mCLASS Math

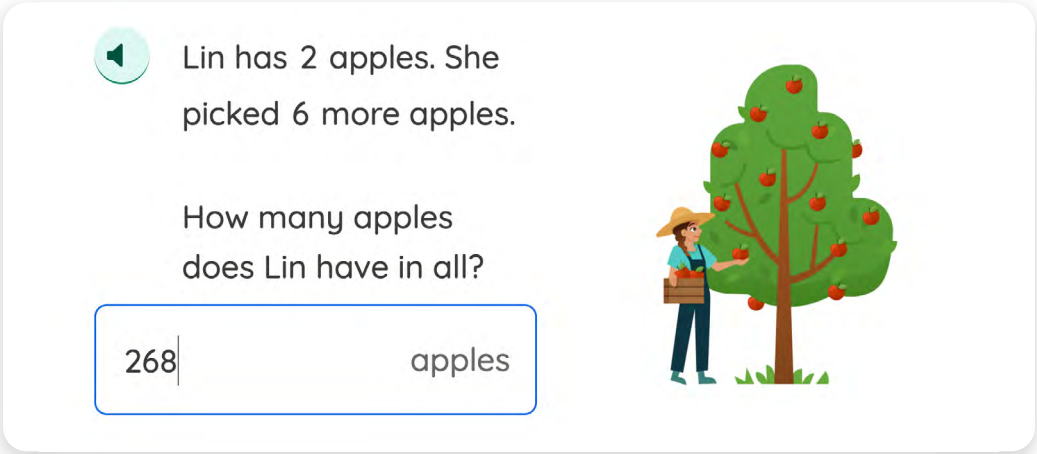
mCLASS Math assessments are automatically scored. While this seems like a challenging endeavor for an assessment that is primarily constructed response, the state-of-the-art analysis engine is able to analyze student responses to identify valid mathematical thinking beyond strictly correct or incorrect answers. This innovative expansion from binary scoring of performance to include analysis and reporting about student thinking is a uniquely powerful feature of mCLASS Math. These insights , surfaced automatically in the Student Thinking report that is part of the mCLASS Math reporting and analysis suite, drive instructional grouping and recommendations to support targeted intervention.

Score Types

To honor student voice and agency while highlighting student thinking, most mCLASS Math benchmark items are designed as constructed response items. This approach allows students to represent their thinking in a variety of ways through responses input in the answer field; the response validation system was built to allow for diverse response types. In addition to single values, the system considers the following types of responses correct:

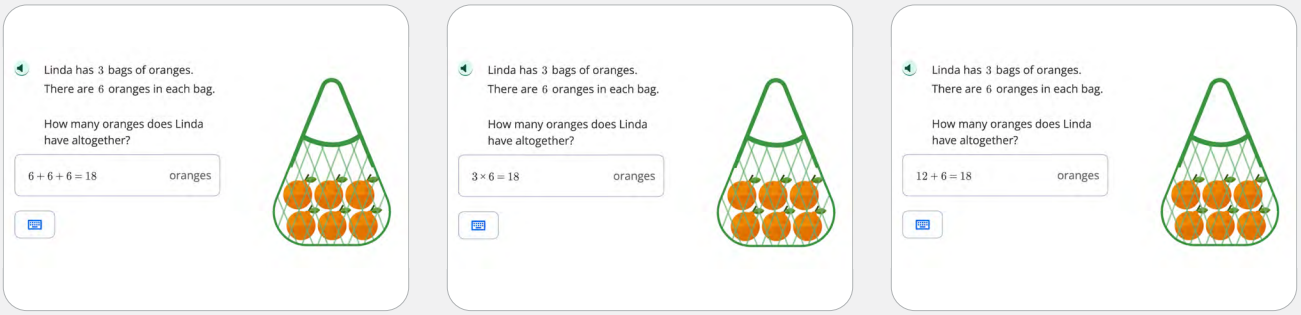
Equations with the Correct Answer

Students can demonstrate their understanding by providing equations that yield the correct solution. For early grade levels (K–1), this includes representations without traditional equation symbols. For example, this "equation" is counted correct in Grade 1.



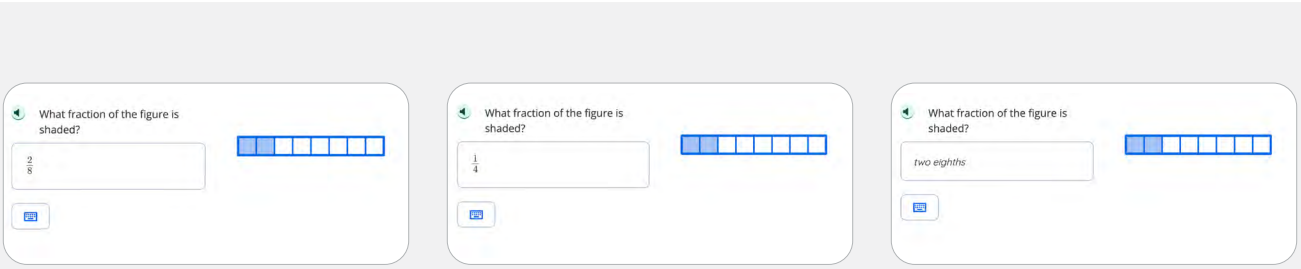
Equivalent Expressions/Equations

The assessment allows for equivalent expressions or equations to be considered correct. This includes expressions that contain the same values or convey the same mathematical relationships, acknowledging that problems can often be approached and solved in multiple valid ways. For example, in this G3 item, various equivalent equations are accepted, which can provide teachers insights into whether students are thinking additively or multiplicatively:



Equivalent Forms of Fractions and Decimals

When appropriate, responses that utilize equivalent fractions and decimals—even in word form—are accepted. This flexibility shows an understanding of the concept beyond numerical representation alone. For example, in this Grade 4 item, equivalent and word forms of the fraction are honored:



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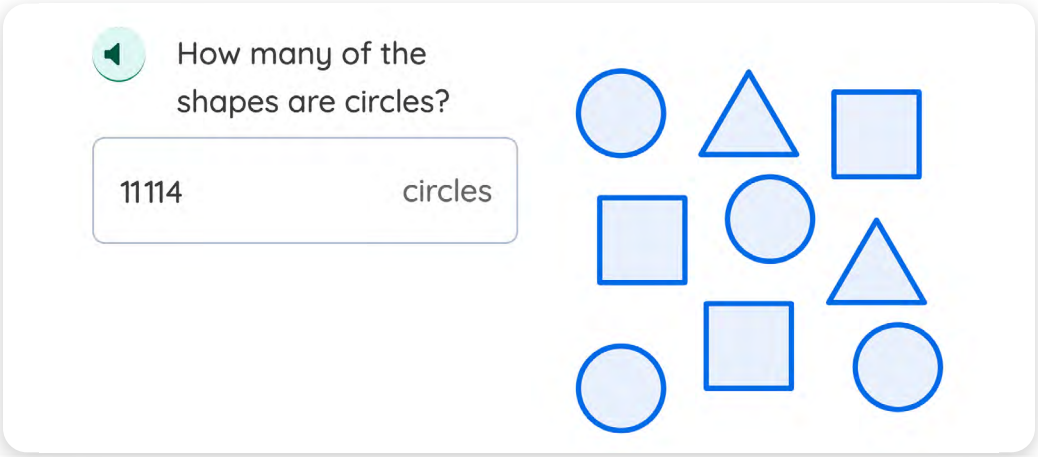
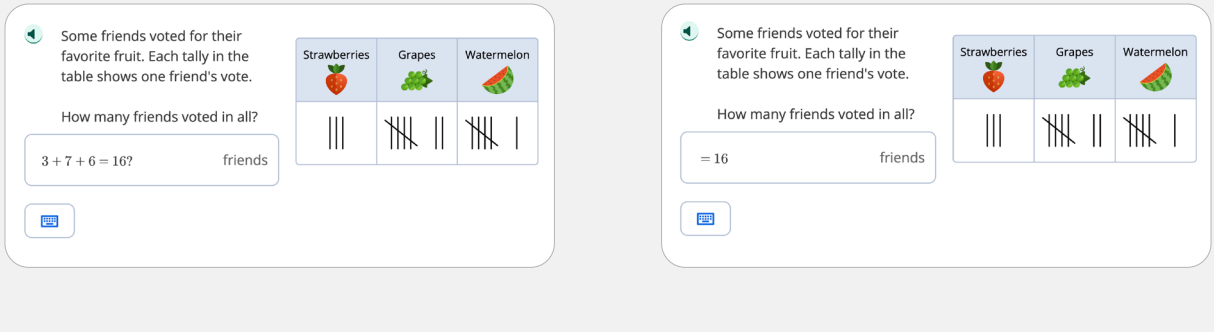
Mark-Total Counting Strategies

Mark-total counting methods are recognized specifically for Kindergarten, supporting early development in numeracy and acknowledging young learners' unique approaches to numerical representation. For instance, in this Kindergarten item, a string of 4 repetitions of 0 or 1 to indicate the total count, followed by the total of 4, are accepted.



Noise

The system is designed to overlook leading zeros, unnecessary symbols, and extra words, focusing on the core correctness of the solution, even if it's not presented in a conventional format. This helps to capture correct answers that might otherwise be obscured by extraneous information. For example, in this Grade 2 item, extra characters, such as an equal sign before or a question mark after the correct answer, are accepted.



Through these varied scoring methods, mCLASS Math not only measures the correctness of students' answers, but also values the depth and diversity of their mathematical thinking. This provides educators with a richer and more nuanced picture of student understanding.

CHAPTER 5:

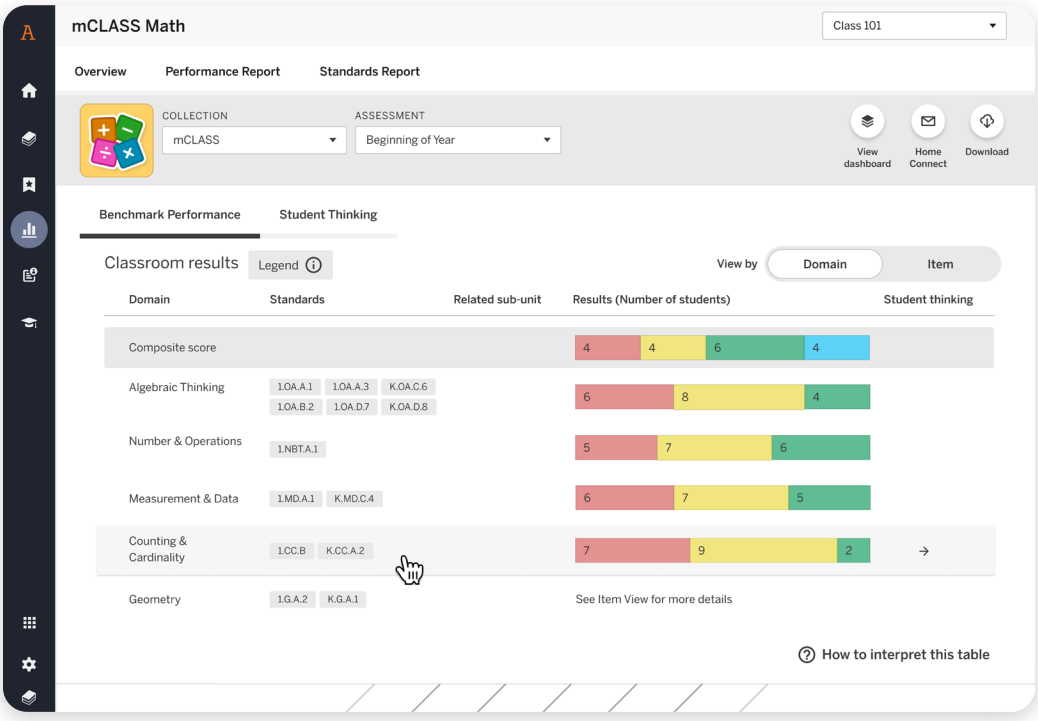
mCLASS Reporting Features

Reporting for Teachers

mCLASS Math includes a suite of reporting and analysis tools that provide instructional groups based on the analysis of student responses that examine the underlying math thinking that goes beyond correct and incorrect scoring. Teachers can see how students answered each problem and identify the math concepts and skills in which students demonstrate mastery, as well as areas to build on. This insight helps teachers support student learning for grade-level math development and provides recommendations for instructional grouping and targeted interventions.

Benchmark Performance Report

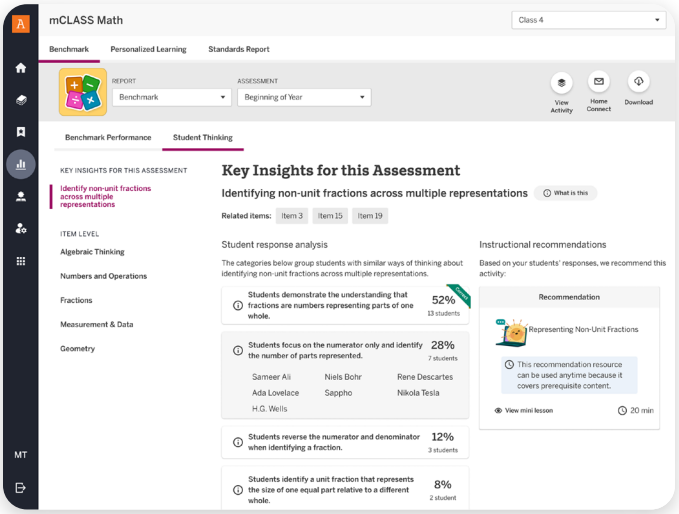
The Benchmark Performance Report helps teachers identify students for intervention and informs core instruction and differentiation. Teachers can see a summary of overall class performance and a detailed table with composite scores and interpretations for each student's overall performance and domain performance for each screening. Teachers can also view all student responses to every item on the Benchmark assessments.



Example of the mCLASS Math Benchmark Performance Report for Beginning of Year

Student Thinking Report

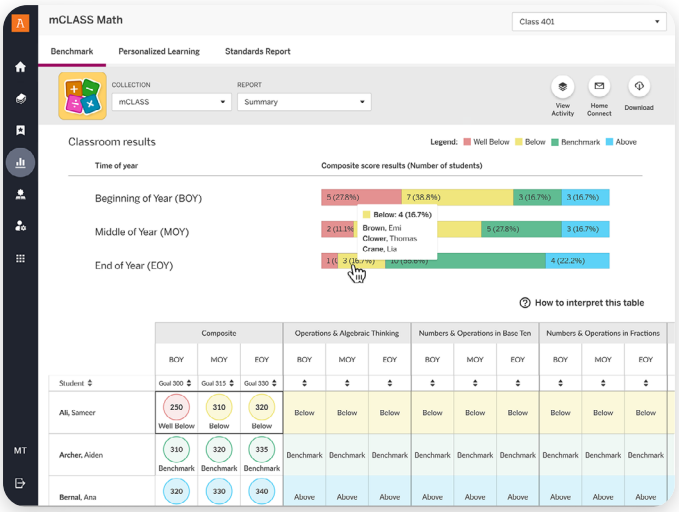
The Student Thinking Report provides insights from actual student work to reveal what students know and where to focus instructional support.



Example of the mCLASS Math Student Thinking Report for grade 4

Summary Report

The Summary Report provides an at-a-glance view of class and student performance across the three screening periods, allowing teachers to compare performance and progress across times of year, and evaluate performance against the meeting of grade-level goals.



Example of the mCLASS Math Summary Report

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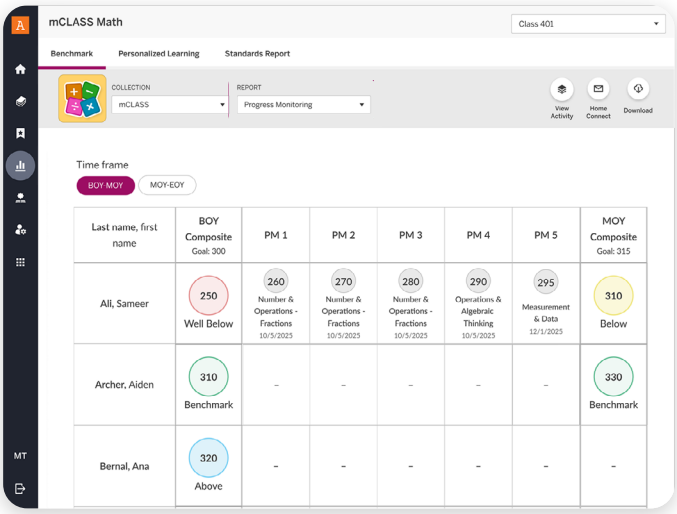
Progress Monitoring Report

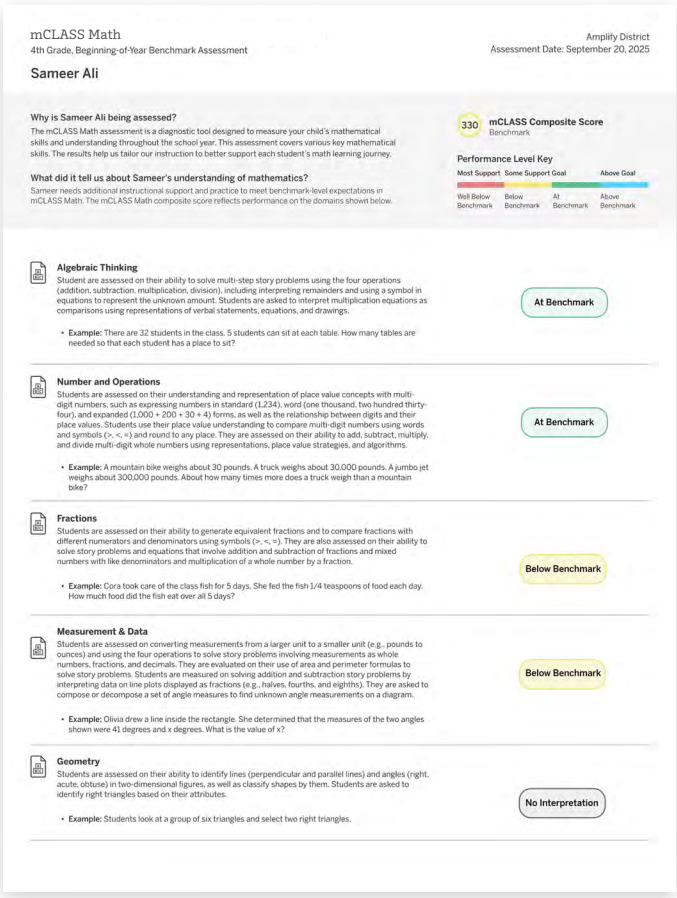
The Progress Monitoring Report provides frequent updates on student performance in between screening periods, to help evaluate progress toward meeting the next benchmark goal and to inform teachers whether students need continued intervention support.



Example of the mCLASS Math Progress Monitoring Report for grade 44

Home Connect

In parent- and caregiver-friendly language, the Home Connect letter provides information about students' development of math skills against grade-level expectations.



Example of the Home Connect letter for grade 4

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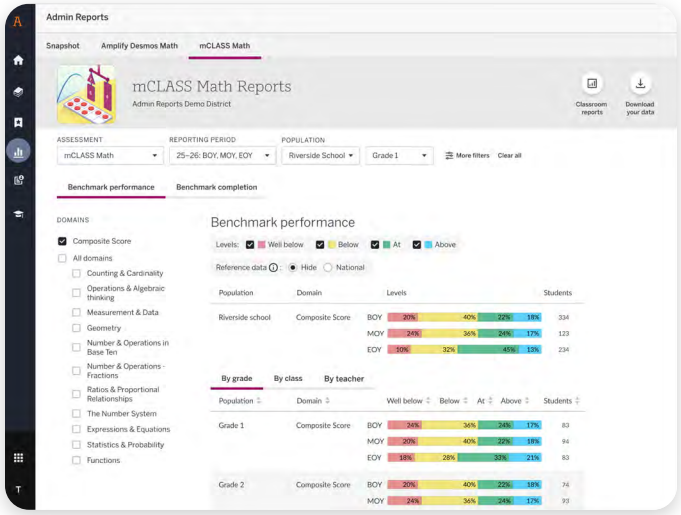
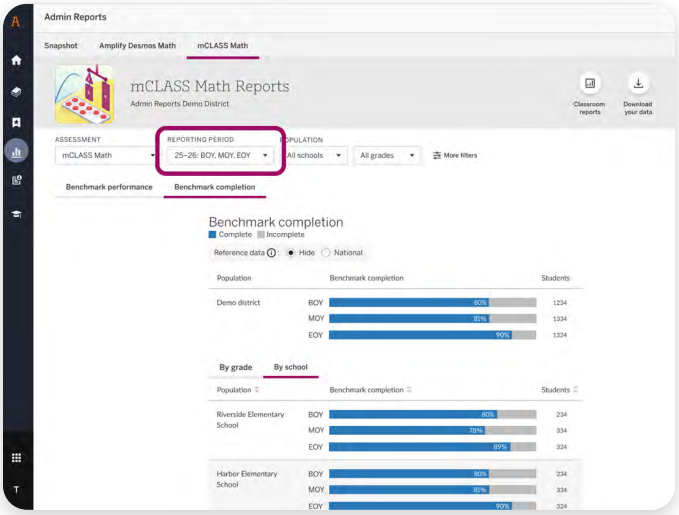
Reporting for Administrators

mCLASS Math includes a reporting and analysis suite that presents different views of assessment results to help support school leaders in their day-to-day decisions regarding intervention, instruction, and resource allocation.

This Reporting for Administrators includes summary charts that display the overall performance and completion metrics for all the students the user has access to. School leaders can customize reports to show data based on a particular population or student demographic, using a broad range of filters. Additionally, school leaders can flexibly analyze assessment data across all districts and programs by exporting student records into a CSV file, which can be uploaded directly into student information systems.

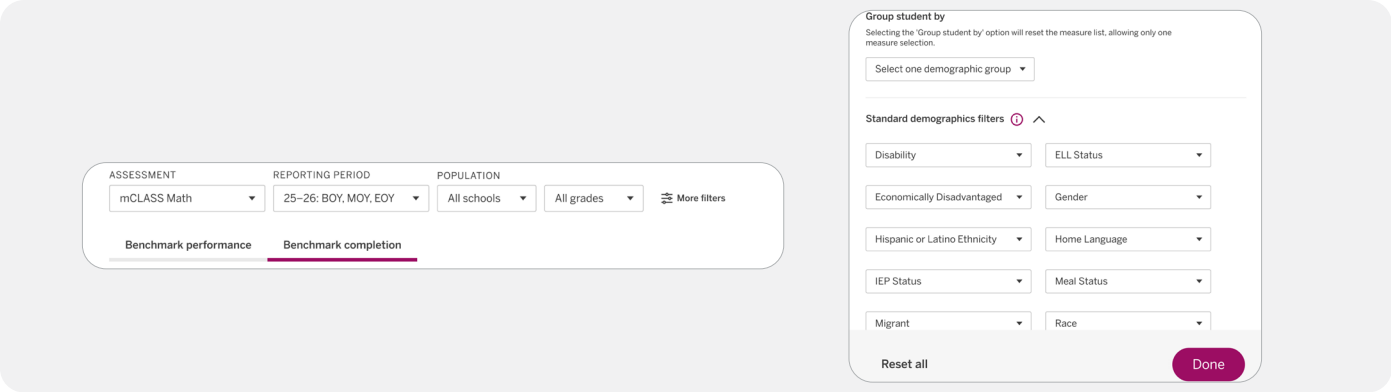


Example of the mCLASS Math Administrator Performance Report



Example of the mCLASS Math Administrator Completion Report

The reporting and analysis suite provides a series of templated reports, parameters, and filters to run summary reports at the class, school, district, and state level. All summary reports are dynamic and allow users to drill down to get more detailed data. Each report can be filtered by subgroups, as well as by student demographics, including attributes such as ethnicity, race, multilingual/English learner (ML/EL) status, economically disadvantaged status, and disability status. Where relevant, users can drill down to disaggregate data to find the students that make up a statistic in a report.



Example of mCLASS Math administrator filters and data download features

CHAPTER 6:

Guidelines for Administration

Getting Started

mCLASS Math assessments are designed for students from kindergarten through fifth grade, offering a comprehensive evaluation of essential mathematical concepts. These digital assessments are flexible, accommodating students with different abilities, and they can be administered at various frequencies, depending on needs such as universal screening and progress monitoring.
To guarantee accurate and consistent results, educators must be trained in standardized administration and scoring procedures for mCLASS Math. This training is vital to ensure data reliability and alignment with established research standards, allowing for meaningful interpretation and instructional use.

This section provides a detailed overview of general administration practices for mCLASS Math, followed by specific guidance on scoring procedures. Standardized administration ensures that results are both reliable and valid, supporting educators in using assessment data to make informed instructional decisions.

Training Procedures and Standardization

To ensure the accuracy and reliability of scores, all examiners administering and interpreting the Amplify mCLASS must undergo rigorous training in standardized administration and scoring procedures. This training prepares examiners to deliver assessments consistently and interpret results accurately, allowing for meaningful comparisons against established research criteria and benchmarks.

Guidelines for Testing Administration

- Preparation: Prior to administration, examiners should gather all necessary materials and ensure that the testing environment is conducive to concentration, free from disturbances, and equipped with all required technological resources.
- Environment: Create an optimal testing environment, making sure that seating arrangements and space are comfortable for students, with minimal distractions.
- Instructions: Clearly communicate to students about the assessment's purpose and structure, using age-appropriate language to ensure understanding.

Administration Time

The mCLASS Math benchmark assessments are structured to be completed within a 30-minute session. This time frame is designed to fit into regular class periods while allowing educators to gather essential insights into each student's mathematical understanding.

In instances where students are unable to complete the assessment within the allocated time, due to unforeseen circumstances or interruptions, makeup sessions should be scheduled. These makeup sessions ensure that all students have the opportunity to complete the assessments and that the data collected reflects a comprehensive understanding of their abilities.

Educators are encouraged to keep a close eye on the pace of the assessment and to support students in managing their time effectively. If a student seems particularly affected by time constraints, consider addressing this in future sessions to help them improve their time management skills within an assessment context. Remember, the goal is to accurately capture each student's mathematical thinking and readiness, providing valuable information for guiding instruction.

Technology Requirements

mCLASS assessments are optimized for most touchscreen devices and computers using Chrome or Safari web browsers. Please check our device support lifecycles and purchase recommendations lists below prior to purchasing.

For more information, see: **https://amplify.com/customer-requirements/**.

Technology Readiness

Prior to testing, verify that all devices are fully charged and functioning properly. Verify that wireless connectivity complies with the network requirements, allowing each device seamless access to Amplify servers. Confirm that necessary permissions for accessing Amplify URLs are set, and check device settings to accept cookies, reducing the risk of login issues during the assessment.

School year 2024–25 requirements

iPad 7+	1024 x 788 or higher, 32GB or higher	iPadOS 16+	Safari 16+
PC	1.4 GHz dual core or greater, 1024 x 768 or higher, 4GB of RAM or higher	Windows: 10+	Chrome (latest two versions)
Chromebook	1.4 GHz dual core or greater, 1024 x 768 or higher, 4GB of RAM or higher	Chrome OS	Chrome (latest two versions)
Mac	1.4 GHz dual core or greater, 1024 x 768 or higher, 4GB of RAM or higher	macOS 13+	Safari 13+, Chrome (latest two versions)

List of IP Addresses to Allow

To make sure all Amplify programs are accessible by your district, add the appropriate URLs to your district's firewall. Please use this list to ensure that the appropriate IP addresses are accessible by users within your school's network: **my.amplify.com/allowlist**.

Network environment minimum requirements:

- Wireless access points: 802.11g/n/ac compatible
- User devices: Connect to Amplify servers via ports 80 and 443.
- Latency: No more than 165 ms during peak utilization
- Connection speed: At least 2 mbps per device during peak usage (10 mbps recommended)
- For more information, see **Getting Started**.

CHAPTER 7:

Teacher Experience

Managing Enrollment Data

Confirm that all student enrollment data is up to date and accurately entered into the system. This data will facilitate individualized assessments and generate personalized reports, offering insights tailored to each student's needs.

You can find more information and access your enrollment data at our **Amplify Enrollment Portal**.

Setting Up the Testing Environment

Creating an ideal testing environment is crucial for obtaining accurate and meaningful assessment results with mCLASS Math. This environment must minimize distractions and interruptions to allow students to focus entirely on the tasks at hand. Here's how to ensure your testing environment supports effective assessment:

Quiet Location

Select a classroom or location where distractions are minimal, such as a dedicated testing room or a quiet corner of the classroom. The space should be free from external noise sources, like hallway traffic or playground activities, to help maintain students' concentration on their assessments.

Organized Classroom Setup

In classroom settings where mCLASS Math is administered, ensure that students not participating in the assessment are engaged in quiet, independent activities. Students should have clear instructions on what they can do while waiting their turn or after completing their assessment, such as reading or educational games that do not interfere with the testing process.

Minimal Interruption During Testing

Coordinate with school administrators and support staff to minimize announcements and disruptions during testing periods. If possible, display signs indicating that testing is in progress, to discourage interruptions like unscheduled maintenance work or visitor entry.

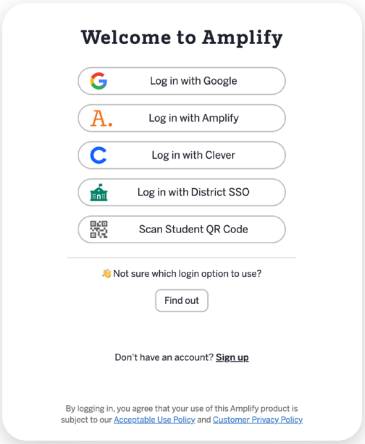
Supervisory Support

Provide supervision by a trained staff member who can facilitate smooth administration, address any technical issues immediately, and offer reassurance or guidance to students as needed. This person should ensure that the environment remains conducive to testing throughout the session.

Ensuring a well-structured and quiet testing environment aids in the successful administration of mCLASS Math, helping educators gain reliable insights into students' mathematical abilities and informing subsequent instructional steps effectively.

Accessing the System as an Educator

Logging into the Amplify platform is straightforward, with multiple options to accommodate a variety of district setups and personal preferences. Follow the steps in the next section to access the system securely.



Log In to Amplify

Start by navigating to **learning.amplify.com**. From there, follow the instructions below to get logged into Amplify.

Click the login method used by your school or district. If you used Amplify usernames and passwords last year and have not been notified of a change in login methods, click "Log In with Amplify." If you're not sure which option to use, click "Find out" for more guidance.

Troubleshooting Login Issues:

- Error messages or blank screens:
  - Confirm that Amplify's URLs are not being blocked by your district's content filter. Contact your district IT department for URL permissions.
  - Ensure that your device is set to accept cookies, as this can affect login capabilities.
- Continued issues:
  - If problems persist, reach out to Amplify Customer Care and Support. Use the chat icon within the program; email help@amplify.com; or call (800)-823-1969.
  - When contacting support, please provide:
    - Your district's name
    - The login method you are using
    - Your email address
    - Your full name
- Third-party errors:
  - If encountering issues with platforms like Google, Clever, or ClassLink, consult your district IT department for assistance.

These options and troubleshooting steps are designed to ensure smooth access to Amplify, enabling educators and students to focus on instructional activities without technical hindrances.

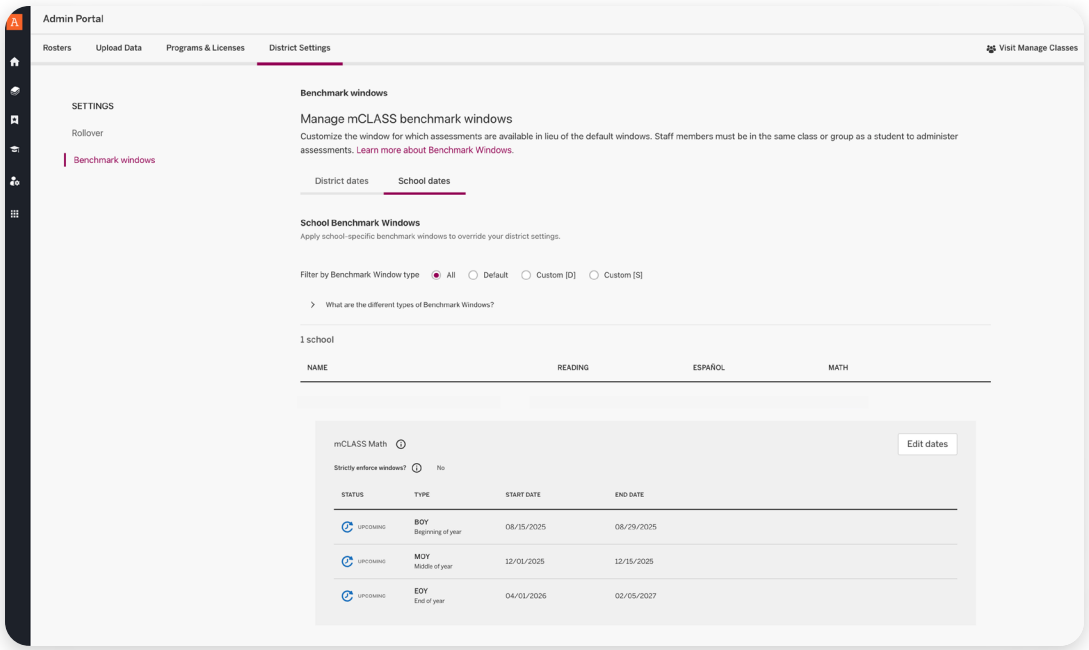
Setting Benchmark Windows

District and school administrators can set benchmark windows for the districts and schools for which they have system access. The default mCLASS Math Benchmark Windows are pre-populated to allow adequate intervals between assessment periods for the three benchmark assessments: beginning of year (BOY), middle of year (MOY), and end of year (EOY).

The default mCLASS Math benchmark windows are configured as follows:

Assessment	Administration Window Opening	Administration Window Closing
Beginning of Year	July 1	September 30
Middle of Year	November 1	February 28
End of Year	April 1	May 31

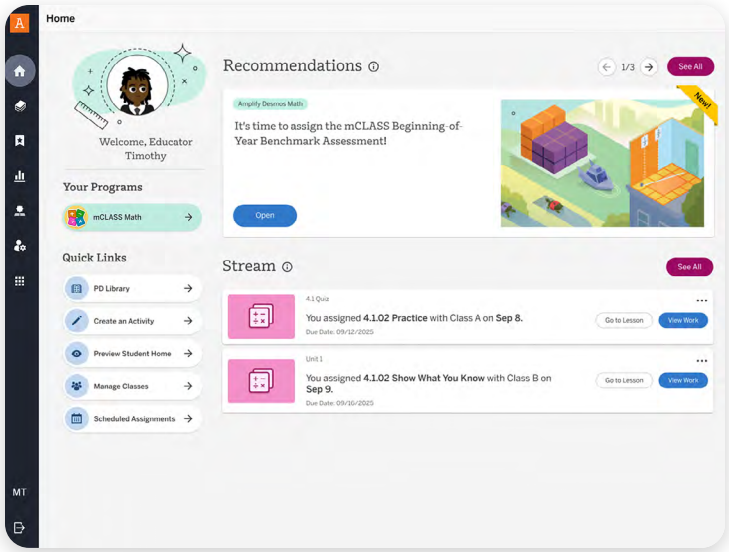
All teachers can view their school's benchmark windows. Teachers can assign benchmarks only during the corresponding benchmark windows.



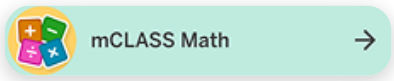
How to Assign Assessments

After logging in, teachers arrive at **Educator Home**, to find a streamlined way to access your assessment, reporting, and instructional tools. Educator Home may look different depending on your product license.

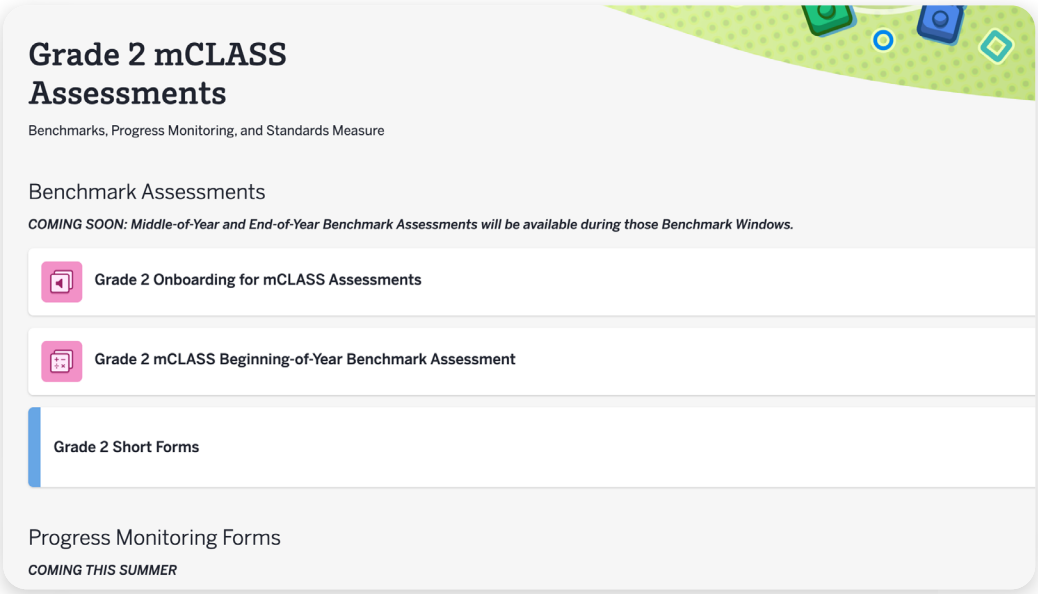
The Educator Home page provides ready access to lesson-related content and student data. The Recommendations have been streamlined, and a Quick Links section gives convenient access to other parts of the platform.



- Click on the mCLASS Math Program pill to access program assignments.
  - The mCLASS Math program is listed under Your Programs in the left-hand column.



- To assign a specific grade-level assessment, teachers click on the appropriate grade level on the left-side panel or on the page.
- Teachers see the selected mCLASS Math Grade collection, organized with each time of year (TOY) assessment as an activity in the collection.
  - The onboarding activity provides students with opportunities to check their audio and interact with tools to prepare them to work on items.
  - To assign the TOY assessment, click on the appropriate assessment activity.



- Teachers will see a list of all the classes to which this form can be assigned.
  - To assign the Form, teachers can click on the purple Assign button.

- Teachers can choose:
  - Assign to Class: Which class(es) teachers want to assign to
  - Schedule: When (date/time) teachers want the class to get this assessment
  - Due Date: When (date/time) this assessment is due
- Once happy with a selection, teachers can select the Assign button.
  - Repeat this process to assign each form
- After assigning, teachers can:
  - See a record of each class assignment.
  - Access the activity with the Teach button.

The Assign button will only be active during the corresponding Benchmark Window. For example, the Assign button for Middle-of-Year Benchmark Assessment will not be active during the Beginning-of-Year Benchmark Window. Teachers may be able to preview the assessment but will not be able to assign the assessment until the benchmark window is open.

Teacher Dashboard for Assessment Monitoring

The Teacher Dashboard is an integral tool for educators, providing real-time insights and controls to effectively manage and monitor assessments. It empowers teachers to take a more interactive and informed approach to student engagement and learning outcomes. Here's how you can utilize the different tabs:

Summary Tab

Take Attendance
The Summary Tab allows teachers to quickly take attendance by identifying which students are logged in and actively participating in the activity. This feature helps establish that all students are present and accounted for before beginning or continuing an assessment.

Monitor Pacing During the Activity
Teachers can keep track of the pacing of the activity across the class, identifying which students are progressing smoothly and which might require additional support or a slower pace to fully engage with the material.

Pause an Activity for All Students
If students require a break, the Pause feature allows teachers to halt the activity for the entire class with a single action.

Teacher Tab

View Each Item with Student Responses
This tab provides a detailed look at each assessment item alongside individual student responses, offering teachers insight into students' understanding and approaches.

Present Teacher View With Responses
Teachers can present responses, including correct and varied solution methods, to the class or staff. This visibility promotes peer learning and helps in addressing misconceptions in real time.

Student Tab

View Each Item from the Student Perspective
Understanding how each test item appears from the student's perspective allows teachers to better appreciate the student experience and potentially address usability issues.

Present the Student View to the Class
Teachers may use this view to present an item to the full class, without revealing any responses. This feature aids in illustrating points and instructing students on complex problems collectively.

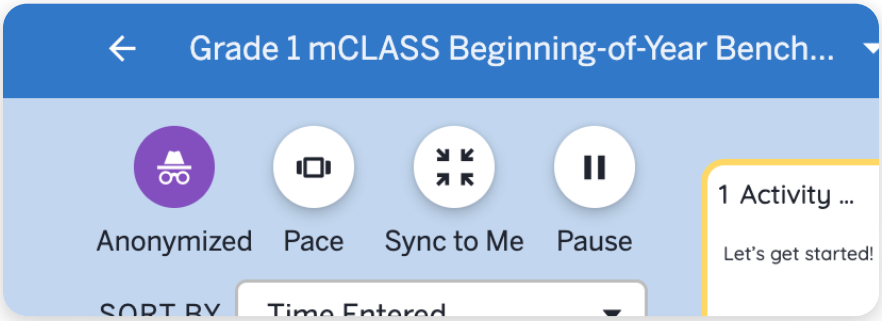
Providing Instructions and Encouragement

Administering mCLASS Math involves maintaining a consistent and standardized testing environment. Direct feedback regarding the correctness of a student's response is not permitted. Students should not be given feedback on their performance during or after an assessment.

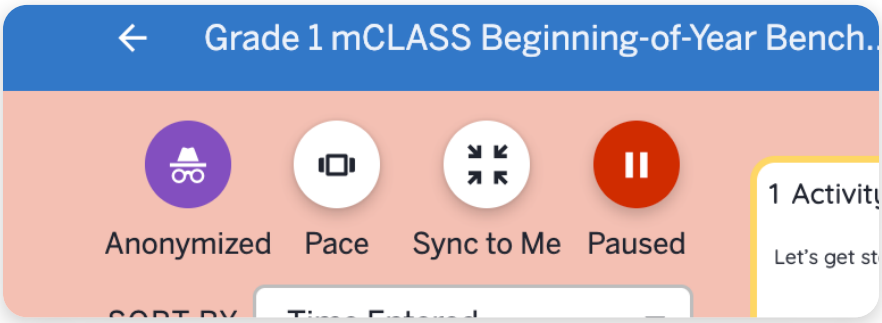
However, providing encouragement that promotes continued effort and focus is advised. Phrases such as "I'm proud of how hard you're working!" or "Keep concentrating, you're doing well!" reinforce positivity and reassure students while avoiding influencing their perceptions of their performance. The Onboarding Activity serves as preparation, and educators should adhere strictly to the standardized procedures. Throughout the assessment, consistency in tone and encouragement helps foster a positive testing experience aligned with students' day-to-day learning interactions.

Pausing and Resuming Administration

The assessment can be paused by clicking the pause button on the Teacher Dashboard page.



Once it is clicked, the color of this bar becomes orange, to indicate that the assessment has been paused. This pauses it for all students; the assessment can be unpaused by clicking the same button.



The assessment auto-saves as the student is completing the assessment. If the assessment is paused and then un-paused, a student is then able to go back to the assessment and continue from where they left off to complete the assessment.

Invalidating Administration

Invalidation of assessments is generally discouraged and should only be done for certain situations. The challenge here is deciding when an administration has become invalid.

When to Invalidate an Administration

Situations and errors that invalidate an administration include but are not limited to the student refusing to participate, the student being too ill to participate, and situational interruptions (e.g., school announcements; see University of Oregon, 2020). One of the most common examples of a situational interruption is when a fire drill occurs in the middle of an assessment administration. The distraction alone is enough to invalidate the administration. In other words, even if the alarm were turned back off within seconds, the student's (and test examiner's) attention has been irrevocably distracted.

It is important to be sensitive to less common situations that can also invalidate an assessment administration (University of Oregon, 2020). For example, a student may refuse to comply with instructions—for example, refusing to complete the onboarding activity. A student may be overcome with emotion—for instance, beginning to cry when struggling inordinately with a task. Administration of digital assessments may also involve some unique situations, such as when a student selects answer options without reading the prompt or when a student's device momentarily freezes.

In each of these cases (and others not listed here), test examiners need to use their professional judgment as to whether (a) events surrounding the administration have resulted in invalidated scores and (b) a new administration ought to be undertaken (University of Oregon, 2020). For example, if a student is crying, the test examiner needs to decide whether the situation was the result of a bad day, in which case a new administration would be advisable and no score should be relied upon for the current administration. Alternatively, the examiner may decide crying was the result of a task simply being too difficult, in which case a new administration is not advisable and the achieved score should be relied upon.

How to Invalidate

An assessment should be invalidated or deleted when an interruption or mistake occurs that undermines the validity of the score.

To invalidate, the examiner should change the status of the assessment to incomplete. This is done by unlocking the assessment for a student in the Teacher Dashboard. From the dashboard, click the checkmark next to the student's name and mark it as incomplete. This will re-open the assessment for re-administration. The student will see the assessment reappear on Student Home.

If the whole class needs to have their assessments invalidated, the examiner can archive the assignment and re-assign the whole assessment at a later date.

Approved Accommodations

mCLASS Math is intended for use without modifications with all students and has been validated through standardized procedures. The interpretation of student scores is meaningful only when the assessment is conducted following these standardized methods.

In rare instances, however, multiple accommodations may be approved to ensure an accurate assessment of a student's abilities. These accommodations should be implemented only when essential for obtaining an accurate score for a student. Accommodations are warranted only when, without them, there is evidence that the assessment would fail to measure the intended math-related concepts and skill(s). For example, if a student has limited hearing, without appropriate accommodations to address their hearing needs, the student would be unable to hear prompts in grades K–1 and the assessment might inadvertently evaluate the student's hearing rather than their understanding of the math concepts and skills being assessed. In such cases, providing accommodations is both appropriate and necessary.

Approved accommodations for mCLASS Math involve minor adjustments to assessment procedures that are unlikely to alter the interpretation of the results. These accommodations have been approved by mCLASS Math content and assessment experts. Accommodations should only be used when:

- An accurate score is unlikely to be obtained without the accommodation.
- The accommodation is specified in a student's 504 plan or Individualized Education Plan (IEP).

The table below lists the approved accommodations for mCLASS Math. Scores from the assessment administered with these accommodations remain comparable to mCLASS Math benchmark and progress monitoring scores. These accommodations should only be used for students with a documented need, such as those outlined in a 504 plan or IEP.

Acceptable accommodations for mCLASS Math Benchmark and Progress Monitoring measures are in the chart below.

Approved Accommodations	mCLASS Math
Enlarged student screen	x
Colored overlays, filters, or lighting adjustments	x
Assistive technology (e.g., hearing aids, assistive listening devices, glasses)	x
Marker or rule for tracking	x
Quiet setting for testing	x

Any action taken by an assessor that is not listed in the standardized scoring and administration guidelines, and is not an approved accommodation, falls under the category of a modification. Such modifications to standardized directions or scoring rules can lead to results that are significantly different from those obtained without modifications. Examples of unapproved accommodations or modifications include: (a) repeating practice items, (b) providing different or additional models of the item, (c) supplying extra manipulatives such as counters or cubes, (d) altering administration directions, and (e) offering unapproved prompts and feedback.

When unapproved accommodations or modifications are applied, the scores are not valid and should not be interpreted in relation to mCLASS Math benchmark goals and progress monitoring scores.

CHAPTER 8:

Student Experience

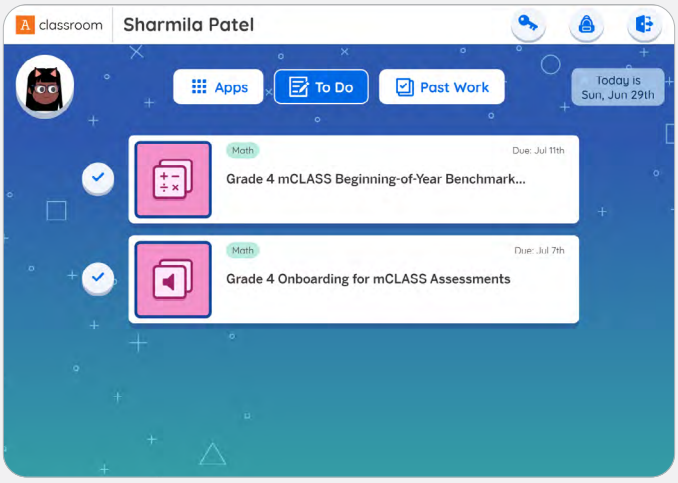
How to Log In

Direct the student to **learning.amplify.com**.

- Have the student click the login method used by your school or district. If you used Amplify usernames and passwords last year and haven't been notified of a change in login methods, click Log In with Amplify.
- Otherwise, have the student log in with one of these methods:
  - Log In with Google using a district-provided email address and password, verified through Google.
  - Log In with Clever using a Clever ID code or username and password, verified through Clever.
  - Scan QR Code using a previously generated and distributed Amplify QR Code, authenticated through Amplify.
- If prompted, have the student enter their credentials.

Launching an Activity

After the student logs in, **Student Home** opens and displays all the student's activities.



Student Home for Kindergarten to Grade 5

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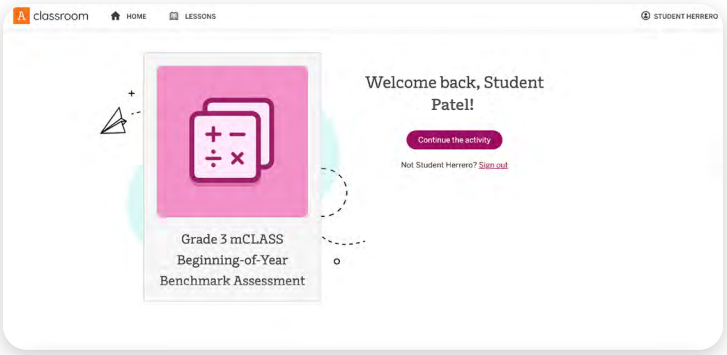
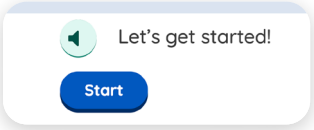
- To launch an activity with this Student Home view, the student should click directly on the activity.



- The student should click the Start Activity button.



- The student will be redirected into the assessment and can begin when prompted.

Preparation: Onboarding Activity

Prior to starting the mCLASS Math assessment, students should first complete the onboarding activity.

- The onboarding activity will take about five minutes.
- It is designed to get students comfortable with navigating the different tools and question types included in the assessment.

We recommend that students have headphones available, so that they can hear the screens read aloud, if needed.

Starting the mCLASS Math Assessmentt

Once students have completed the onboarding activity, which familiarizes them with the navigation and tools of the assessment interface, they are ready to start the mCLASS Math Assessment.

- To begin, students should navigate back to the Student Home by clicking the Home button located in the upper-left corner of the screen.
- From the Student Home, they will see the mCLASS Math Assessment option.
- Encourage students to carefully read any instructions that appear before the assessment starts, so that they are fully prepared to engage with the test items.
- This seamless transition from onboarding to assessment is designed to make students feel confident and ready to demonstrate their mathematical skills and understanding.

Progress Bar

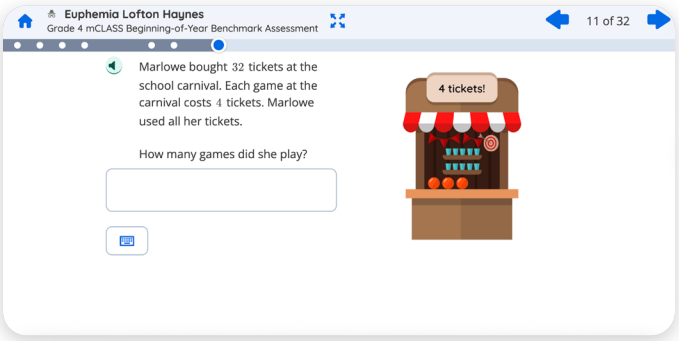
The progress bar is designed to allow students to track progress and revisit skipped questions before they complete the assessment. Students within the benchmark assessment will be able to visualize where they are in the assessment, see their proximity to completion, identify skipped items, and quickly and easily revisit screens with skipped items.

The progress bar appears at the top of the student screen, visually indicating the student's progress through the assessment. It includes a "You Are Here" indicator to show the current item, and a "Furthest Point" indicator to inform students of how much of the assessment remains.

How to Navigate Skipped Items

The progress bar also highlights any screens that have been skipped, allowing students to easily identify and revisit items that need attention before submitting the assessment. Please note that indicators for skipped items are not enabled for kindergarten and first grade.

Students can click on skipped items or on the furthest point indicator within the progress bar to navigate directly to screens they want to revisit and back to the furthest point prior to submitting the assessment, facilitating a more effective review process.



Students can use the progress bar to display where they are in an activity. Clicking on these indicators will navigate a student to these key locations.

Submitting an Assessment

At the end of the assessment, students will need to click the "Done" button for the assessment to be marked as complete and automatically scored. The students will see a message confirming that they are ready to submit.

How to Unlock an Assessment

If a student accidentally completes an assessment, the teacher can go to the Teacher Dashboard and click on the checkmark next to the student's name, then click "Mark as Incomplete." This allows the assessment to be unlocked and accessible to the student again. All previous student work and responses will be saved and unlocked for students to continue working.

Assessment Layout

The mCLASS Math assessment provides a user-friendly interface designed to cater to the diverse needs of students across various grade levels. The layout includes features such as audio read-aloud options and simplified keypads that enhance accessibility and usability, allowing students to focus on demonstrating their mathematical understanding.

Audio Read-Aloud Guidance

Kindergarten to Grade 1

- For younger students, the assessment includes automatically enabled audio read-aloud for all items.
- This feature is designed to assist students who are still developing reading skills, letting them comprehend and respond to each question without needing to read it themselves.

Grade 2 to Grade 5

- Students in these grades have the option to use audio support by clicking the speaker icon available on each item.
- This optional read-aloud feature provides flexibility, allowing students to choose when they need auditory assistance, supporting their independence while accommodating varied reading capacities.

Simplified Keypad

Kindergarten to Grade 1 Keypad

- At these grade levels, the keypad is specifically simplified to include fewer buttons, focusing on basic numerical inputs and essential symbols.
- This design is aimed at aiding young students in navigating the assessment comfortably, reducing potential confusion and allowing them to focus on the mathematics content.

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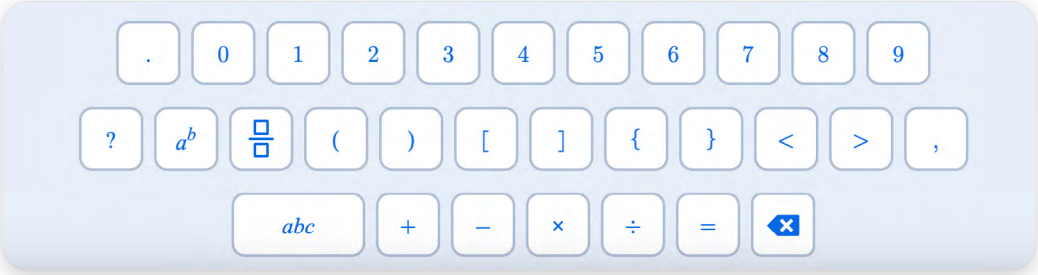
Grade 2 to Grade 3 Keypad

- As students advance to second and third grade, the keypad becomes slightly more detailed to accommodate a broader range of mathematical functions.
- Despite these additions, the design remains simple enough for students to operate it with ease.

Grade 4 to Grade 5 Keypad

- For these older grades, the keypad incorporates additional functions necessary for solving more complex mathematical problems.
- It retains an intuitive layout that helps students input their answers efficiently, facilitating a seamless testing experience.

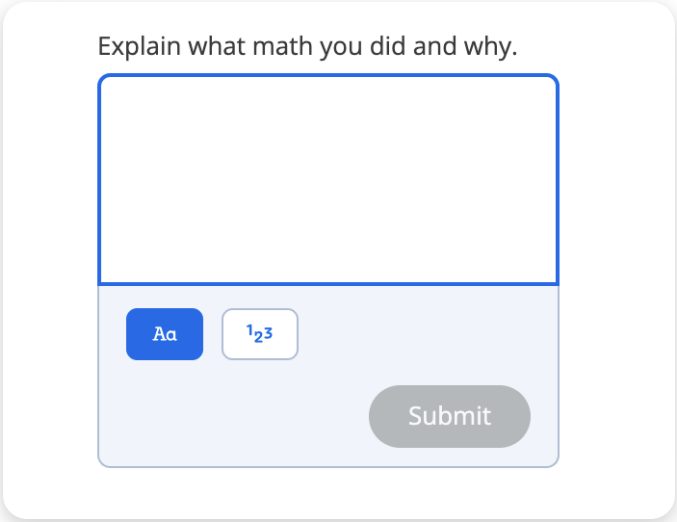


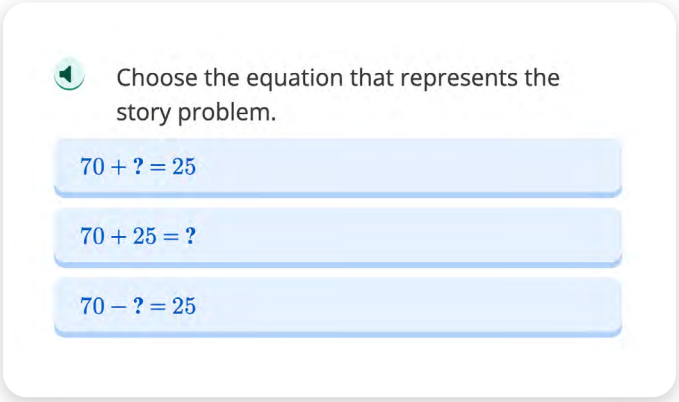
Item Design

The mCLASS Math assessment features a variety of item types designed to engage students and accurately assess their understanding of key mathematical concepts. These items are crafted to provide insights into student thinking, catering to different learning styles and ways of demonstrating knowledge.

Communication Items

Communication items allow students to express their understanding either numerically—by entering an equation—or through text written with a keyboard, or both. Communication items are valuable for assessing students' ability to convey their reasoning and solution processes, offering insights into their conceptual understanding and problem-solving skills. These items are unscored.



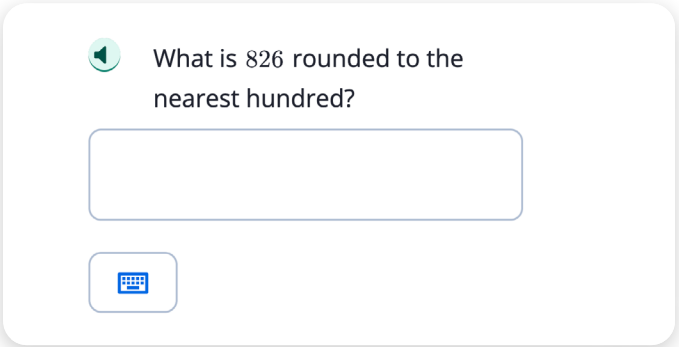


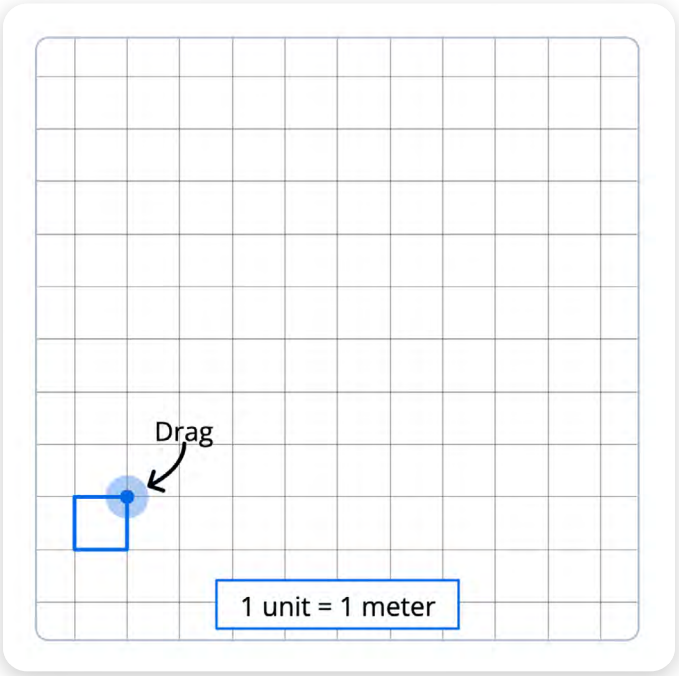
Multiple Choice

Multiple-choice items are structured to present clear and concise questions and a list of possible answers. This format allows students to select the option that best fits their understanding. Multiple-choice questions are valuable for gauging recognition, recall, and the application of learned skills in situations with defined parameters.

Input

Input items require students to actively engage with the assessment by typing or entering numerical or algebraic responses directly. This item type emphasizes the accurate expression of mathematical thinking and problem-solving skills, requiring deeper engagement than selecting an option from a given list.





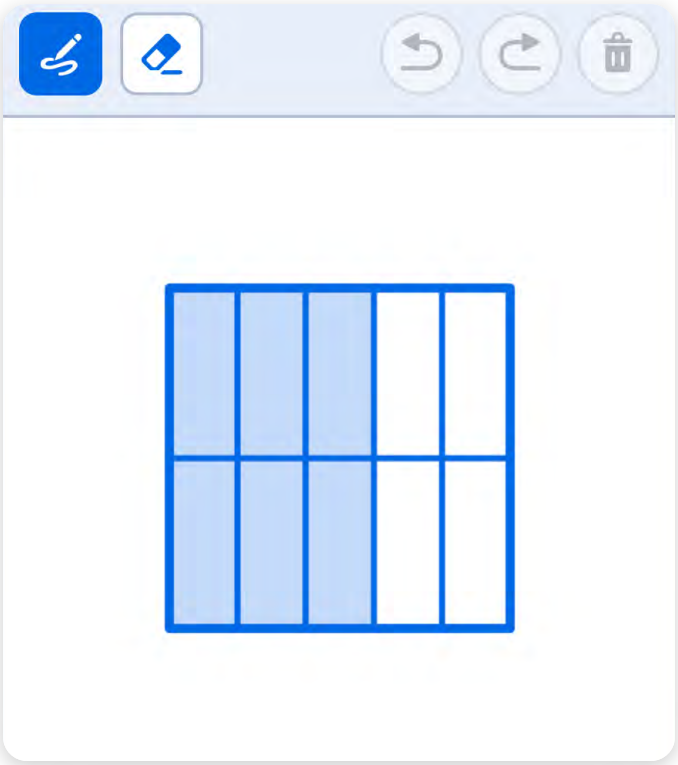
Drag and Drop

Drag and drop items provide an interactive element that allows students to manipulate objects or numbers on the screen to form sequences, match items, or complete patterns. Drag and drop items often highlight conceptual understanding and the ability to sequence processes or ideas logically.

These item types are thoughtfully integrated into the mCLASS Math assessment to capture a wide array of student skills and understanding. By employing multiple item formats, the assessment can more accurately reflect student knowledge and cognitive processes, enabling educators to make informed instructional decisions.

Optional Tools

To enhance the assessment experience and support diverse mathematical strategies, mCLASS Math provides optional tools that allow students to interact with items in ways that mirror real-world problem-solving.



Digital Sketch Pad

The digital Sketch Pad is an interactive tool available on select assessment items, designed to support students in visually representing and working through mathematical problems. The digital Sketch Pad encourages students to explore multiple pathways to a solution, making their thinking visible and providing educators with insights into their problem-solving processes.

This tool allows students to draw, annotate, and work out solutions directly on the screen, which can be particularly useful for counting, organizing thoughts, and illustrating algorithms.

Scratch Paper and Pencil

The use of traditional scratch paper and pencil is encouraged during the assessment. This physical medium allows students who prefer tactile methods of solving problems to sketch, note, and calculate answers during the assessment.

Using scratch paper can help students manage complex problems, reduce cognitive load by offloading memory work, and organize their thoughts more clearly.

CHAPTER 9:

Progress Monitoring

In this section, we discuss the specific use of mCLASS Math for monitoring student progress. Topics include recommendations about which domain to use, questions around the frequency of progress monitoring, and decisions about when to change progress monitoring domains. The guidelines provided below are based on a theoretical progress of mathematical concepts and skills. The Progress Monitoring Validation study in grades K–5 will be conducted over the course of the 2025–26 school year. Based on the results of that study, the recommended progress monitoring domains may change.

Why Progress Monitor

Progress monitoring forms were developed to track student progress, identify learning gaps, and inform instructional decisions. For students who are below grade level and in need of intervention support, mCLASS Progress Monitoring (PM) assessments provide frequent checks between screening periods to guide adjustments to instruction. Teachers assign grade-level, time-of-year-specific and domain-specific PM forms that align with the targets of instructional support. The domain-level scores from progress monitoring update the validated composite score to provide information on changes in overall performance and growth. This 15-minute assessment for progress monitoring provides domain-specific forms that are brief and align with the targets of instructional support.

Development of Progress Monitoring Forms

Development of progress monitoring forms followed the benchmark assessment development process, which occurred in four phases (see Chapter 3 of the Administration and Scoring Guide for more details). In Phase 1, the mathematics concepts and skills to include in the assessment were identified. In Phase 2, assessment targets for each benchmark form in each grade level were outlined. In Phase 3, item specifications for each assessment target were generated, including but not limited to defining the assessment target, range of quantities, set of descriptors, item type (e.g., open response, multiple choice), and scoring. In Phase 4, an item writer developed the assessment items. Item specifications were then used to develop multiple forms of the same item within each of the grade-level domains. Following the item development within each domain and by grade level, a team reviewed the content by domain to ensure item specification alignment. Revisions were made as needed. This iterative process continued until all forms were developed for each grade level and domain.

The progress monitoring forms are based on the benchmark assessments that have been validated. Specifically, progress monitoring for the period between the Beginning-of-Year (BOY) assessment and the Middle-of-Year (MOY) assessments are developed based on BOY assessment content within each domain. Similarly, progress monitoring forms for the time between the MOY assessments and the End of Year (EOY) assessment are based on MOY assessment content within each domain. These forms are domain specific, meaning the content within each form is assessing a single domain, as opposed to the benchmark, which assesses all the relevant domains for a grade level. Additionally, Progress Monitoring is only for domains with performance levels, and the number of domains with progress monitoring forms varies by grade level. For each grade's major domain, there are five domain-specific progress monitoring forms for between the BOY and MOY assessments, and another five domain-specific forms for MOY and EOY.

Number of Items by Grade, Time of Year, and Domain

Grade K	Fall	Spring
Counting & Cardinality	9	7
Algebraic Thinking	5	7
Total Items	14	14
Grade 1	**Fall**	**Spring**
Algebraic Thinking	7	7
Numbers & Operations	5	7
Measurement & Data	5	5
Total Items	17	19
Grade 2	**Fall**	**Spring**
Algebraic Thinking	9	7
Numbers & Operations	7	8
Measurement & Data	7	8
Total Items	23	23

Grade 3	Fall	Spring
Algebraic Thinking	9	10
Number & Operations	9	5
Fractions		5
Measurement & Data	8	9
Total Items	26	29
Grade 4	**Fall**	**Spring**
Algebraic Thinking	7	6
Number & Operations	8	7
Fractions	7	7
Measurement & Data	6	7
Total Items	28	27
Grade 5	**Fall**	**Spring**
Number & Operations	9	10
Fractions	9	7
Measurement & Data	7	7
Total Items	25	24

Choosing a Domain for Progress Monitoring

One critical step in progress monitoring students who receive intervention is knowing which domain to use. Generally speaking, the best practice involves monitoring progress for the domain on which intervention is most focused. With the exception of students participating in the Progress Monitoring Validation Study, in no situation should student progress be monitored with a domain on which they did not demonstrate risk. Nonetheless many students will have multiple indicators of risk and receive multi-component interventions. Note that it may be advisable for students receiving multi-component interventions to have their progress monitored in more than one domain. However, we offer guidelines for how to pick a single progress monitoring domain to use under specific conditions.

During the 2025–26 school year, we will be conducting a progress monitoring field study to determine which mCLASS Math domains are the strongest for capturing change over time. In the interim, we offer a theoretical progress of domains that can be used for progress monitoring in the grades in which these domains are available and where a student has demonstrated risk. If a student shows risk in multiple domains, progress monitoring should focus on one or more of the following domains in this order:

Order of Priority Domains by Grade Level

Grade	Priority Domain 1	Priority Domain 2	Priority Domain 3	Priority Domain 4
Kindergarten	Counting & Cardinality	Algebraic Thinking		
Grade 1	Algebraic Thinking	Number & Operations	Measurement & Data	
Grade 2	Algebraic Thinking	Number & Operations	Measurement & Data	
Grade 3	Algebraic Thinking	Number & Operations	Fractions	Measurement & Data
Grade 4	Algebraic Thinking	Number & Operations	Fractions	Measurement & Data
Grade 5	Number & Operations	Fractions	Measurement & Data	

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Frequency of Progress Monitoring

Another important step in monitoring the progress of students who receive intervention is knowing how often to do so. In general, the more foundational the concept or skill and the more intensive the intervention, the more frequently progress monitoring should occur. We recommend progress monitoring every two weeks in kindergarten through fifth grade. For students at some risk who receive strategic support, we recommend progress monitoring every four weeks. To support these recommendations, we have developed 10 equivalent, alternate forms containing grade-level-appropriate content for domains listed in Table X. Five progress monitoring forms for each domain are available for use between the beginning and middle of the year, and five are available for each domain between the middle and end of the year. If additional progress monitoring is needed, forms 1–5 can be readministered consecutively.

Beginning in the school year 2026, we provide 20 progress monitoring forms per grade, allowing for more frequent progress monitoring where necessary.

Recommended Progress Monitoring Frequency by Grade

Grade	Possible Domains	At Risk (Red)	At Some Risk (Yellow)
Kindergarten	Counting & Cardinality Algebraic Thinking	Every two weeks	Every four weeks
Grade 1–2	Algebraic Thinking Number & Operations	Every two weeks	Every four weeks
Grade 3–4	Algebraic Thinking Number & Operations Fractions Measurement & Data	Every two weeks	Every four weeks
Grade 5	Number & Operations Fractions Measurement & Data	Every two weeks	Every four weeks

Determining Response to Intervention

mCLASS Math plays a crucial role in Response to Intervention by providing actionable data for identifying students' needs, monitoring progress, and informing instructional decisions. The three-times-a-year benchmark assessments offer universal screening to identify students who require additional support. For students receiving intervention, progress monitoring informs whether intervention is working or adjustments are needed to improve student learning. Through real-time reporting and data-driven recommendations, educators can differentiate instruction and provide targeted interventions based on students' specific skill needs.

The domain-specific progress monitoring assessments help determine student growth in the specific area that is the target of intervention instruction. Progress monitoring results update the composite score to provide the latest view of student performance against benchmark goals to determine whether students are making adequate growth or whether adjustments are needed to the intervention plan. The updated overall score reflects whether the student is on track for meeting grade-level expectations. For students whose progress meets grade-level expectations, teachers may want to consider discontinuing the intervention related to that domain. mCLASS Math efficiently assesses students' skills and thinking to give teachers instant recommendations for small-group and individualized instruction to help build grade-level proficiency.

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