K-12 Mathematics in North Carolina

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November 2026

Desired Outcomes

- **Share** North Carolina's direction for strengthening K–12 mathematics instruction and student experiences.
- **Highlight** key changes to mathematics standards, future-ready experiences, and implementation plans.
- **Examine** student performance trends and opportunities to accelerate mathematics achievement.
- **Review** legislation, partnerships, and statewide initiatives supporting mathematics teaching and learning.



ACHIEVING EDUCATIONAL
EXCELLENCE

Prepare Each Student for Their Next Phase in Life

PILLAR 1

> "The future of mathematics in North Carolina is shaped by the standards we design, and how they come to life for students in classrooms across the state."

Focus Area 2 | Elevate Teaching and Learning



ACTION 3

Design a **Pre-K–12 Teaching and Learning Framework** with PSUs to set shared expectations for standards-aligned instruction, integrated supports and access **high-quality learning** for all students.

Focus Area 1 | Ignite Early Learning



ACTION 2

Build on the implementation of North Carolina's Science of Reading initiative by continuing to expand high-impact literacy practices and **launch a parallel focus on foundational mathematics** to support early learning.

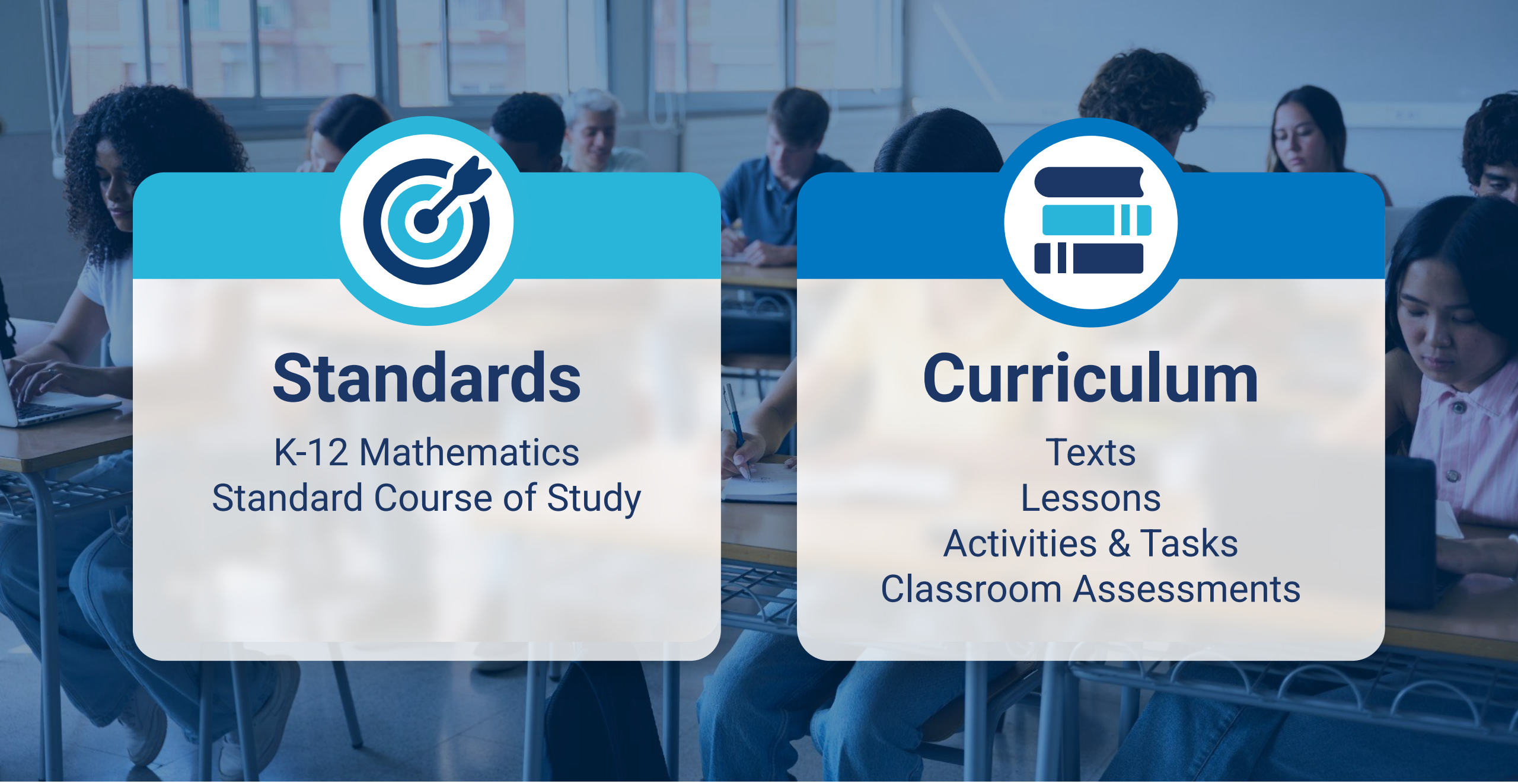
MATHEMATICS IN NORTH CAROLINA

Standards → Students

TRANSFORMING EXPECTATIONS INTO EXPERIENCES



- Mathematical Reasoning
- High Expectations for All
- Alignment to Workforce
- Meaningful Math Experiences
- Applied Learning & Problem Solving
- Data Literacy



Standards

K-12 Mathematics
Standard Course of Study

Curriculum

Texts
Lessons
Activities & Tasks
Classroom Assessments

A Clear Direction for Mathematics in North Carolina

Aligning Standards, Instruction, and Student Experience

Our Approach

Guiding Principles

FOR MATHEMATICS
IN NORTH CAROLINA



- Conceptual understanding, procedural fluency, and application
- Vertical coherence across grade levels
- Rigor with access to advanced coursework
- Relevance to students' futures
- High expectations that build student confidence in mathematics

Shared Priorities

Shaping the Direction of Mathematics in North Carolina

- Strengthening **evidence-based** ***mathematics instruction***
- Supporting the use of **high-quality** ***instructional materials***
- Investing in **professional learning** to ***support teachers***
- Ensuring thoughtful ***screening and placement*** practices
- Preparing for ***implementation*** through phased, transparent approaches

Reinforced Statewide

Golden LEAF Schools Initiative

Focused on rural middle school mathematics

Advanced Courses in Mathematics (AMC) Legislation *(SL 2019-120)*

Goals

- To **broaden access** and **successful participation** in advanced courses.
- To **guarantee the opportunity** to access advanced coursework in mathematics for those students who demonstrate readiness, regardless of student's address and demographic factors.

Guaranteed Access

- For **students scoring at the highest level on end of grade or end of course assessments** to advanced math opportunities.

LEAs Shall Offer

- Advanced learning opportunities in **grades three through five**
- Advanced courses in **grades six and higher**.

Often referred to as auto-enrollment.

Many states are adopting similar policies; **NC was the first state to adopt this legislation**.

Advanced Courses in Mathematics Legislation

Key Components

Definition and Alignment

Provides a clear **definition** of advanced learning opportunities (grades 3-5) - aligned with services and curriculum modifications found in Local AIG plan for those students gifted in math.

Course Offerings

Requires **advanced mathematics courses** to be offered in grades 6 and higher.

Math I Requirement

Outlines **specific requirement** to provide NC Math 1 for 8th grade students (when scoring at the highest level in 7th grade).

- LEAs are still able to place additional students in Math 1 who do NOT score the highest level.

Parental Consent

Requires **parental consent for removal** from advanced content placement after adequate information.

Listening to Our Stakeholders

Insights That Shaped Math Standards Revision

"I'm not a math person"

"Why do I need to learn this?"

"It's okay - math is hard."

What do **all graduates** need to know — and have the opportunity to learn?



How can we ***increase proficiency*** for all students?



How can we increase ***real-world application*** of math?



How can we increase ***student interest and engagement*** ?

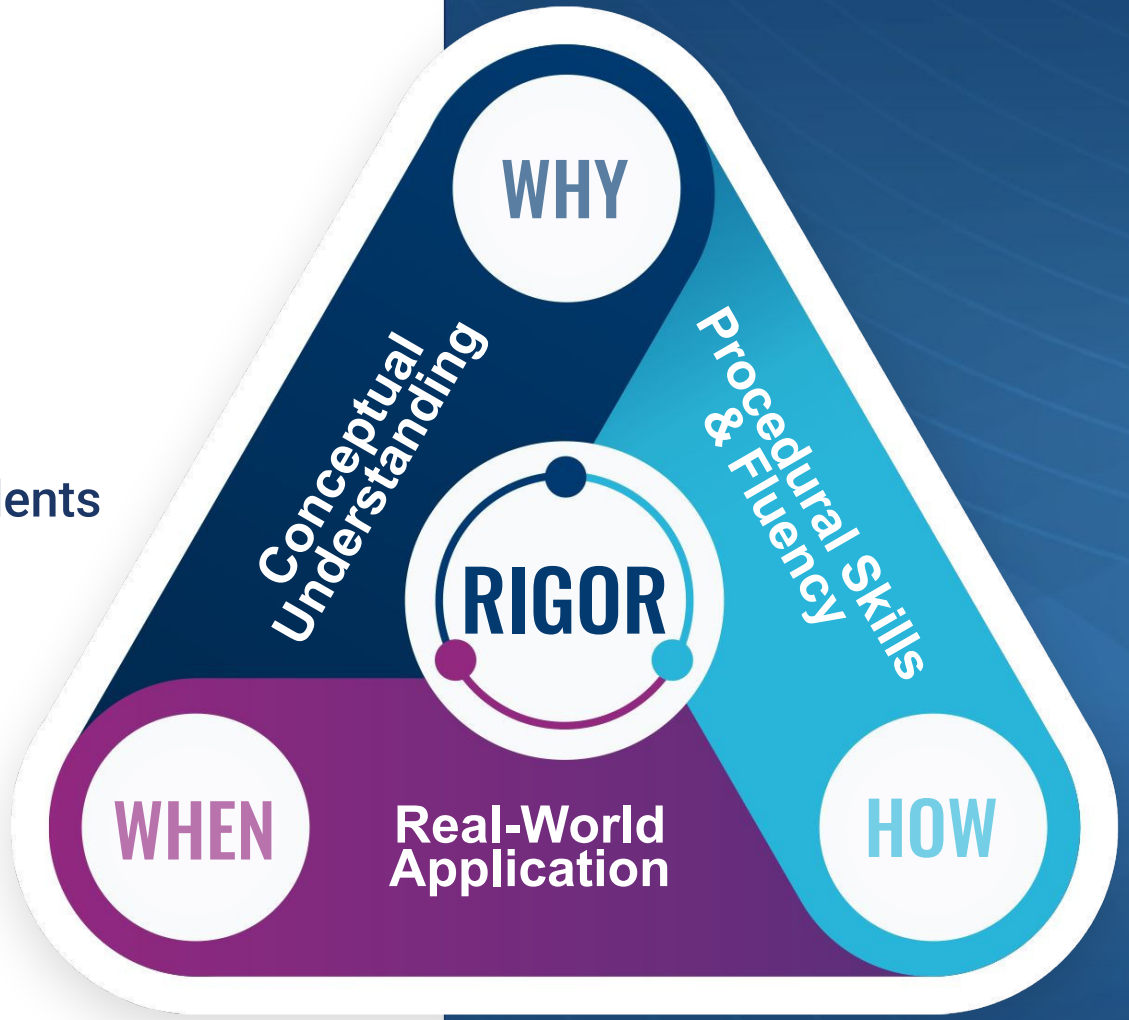
How the Standards Responded

- Streamlined language and clearer expectations
- Improved progression across grade levels
- Maintain rigor with increased relevance for all students
- ***Balanced emphasis on:***

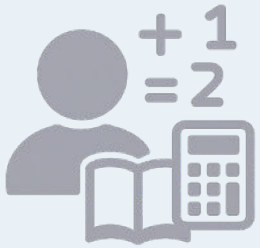
Conceptual Understanding

Procedural Fluency

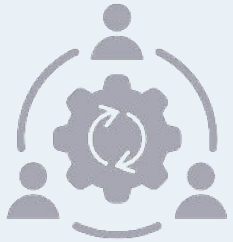
Real-World Application



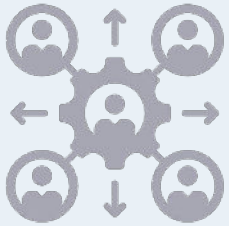
North Carolina Mathematics Standards



Readiness



Coherence



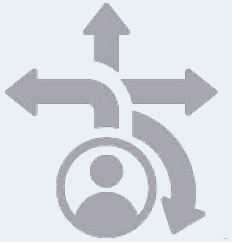
Alignment



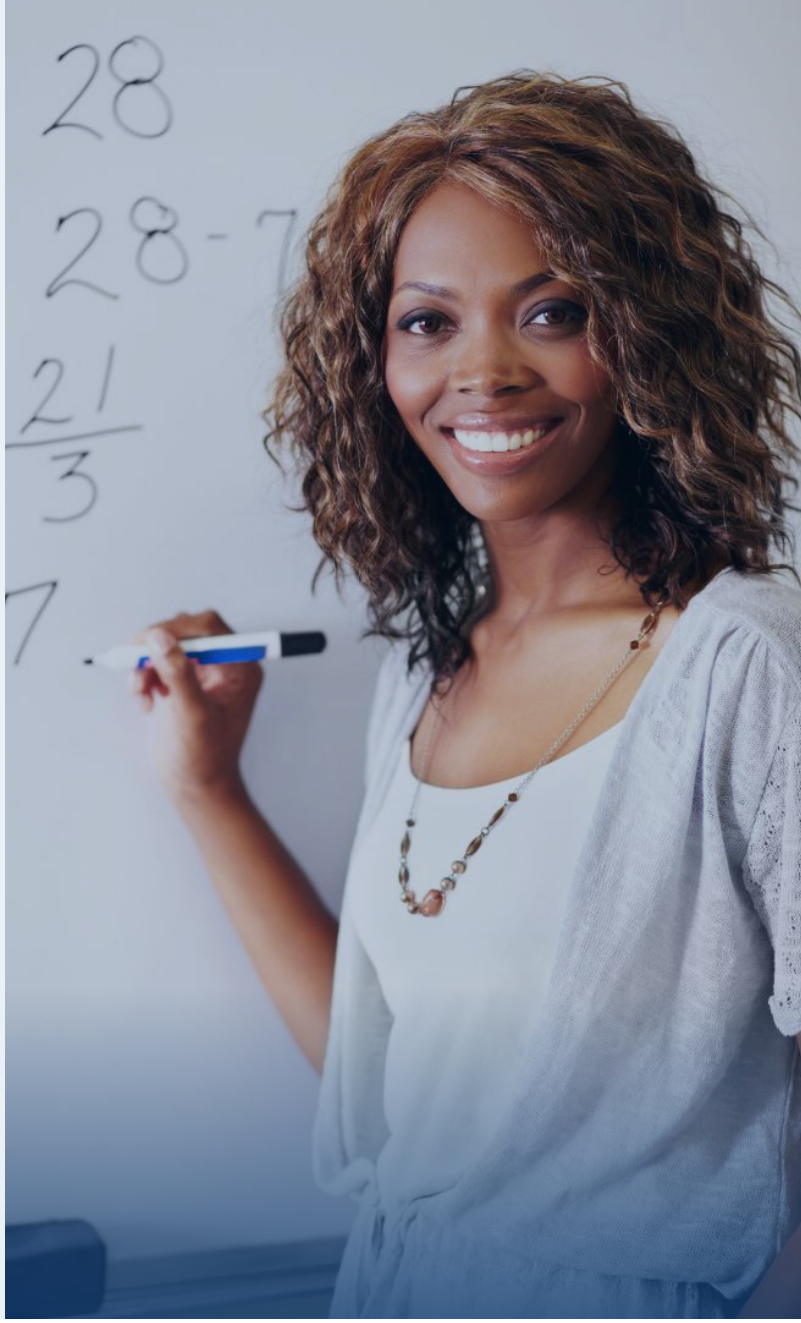
Clarity



Relevance

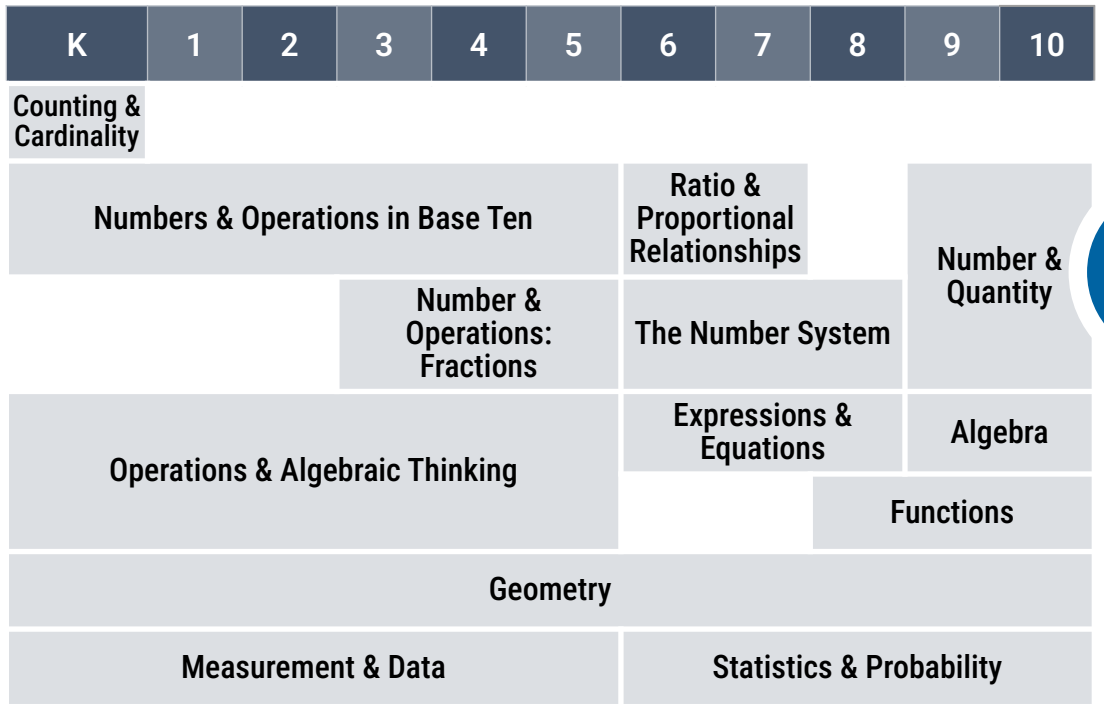


Choice

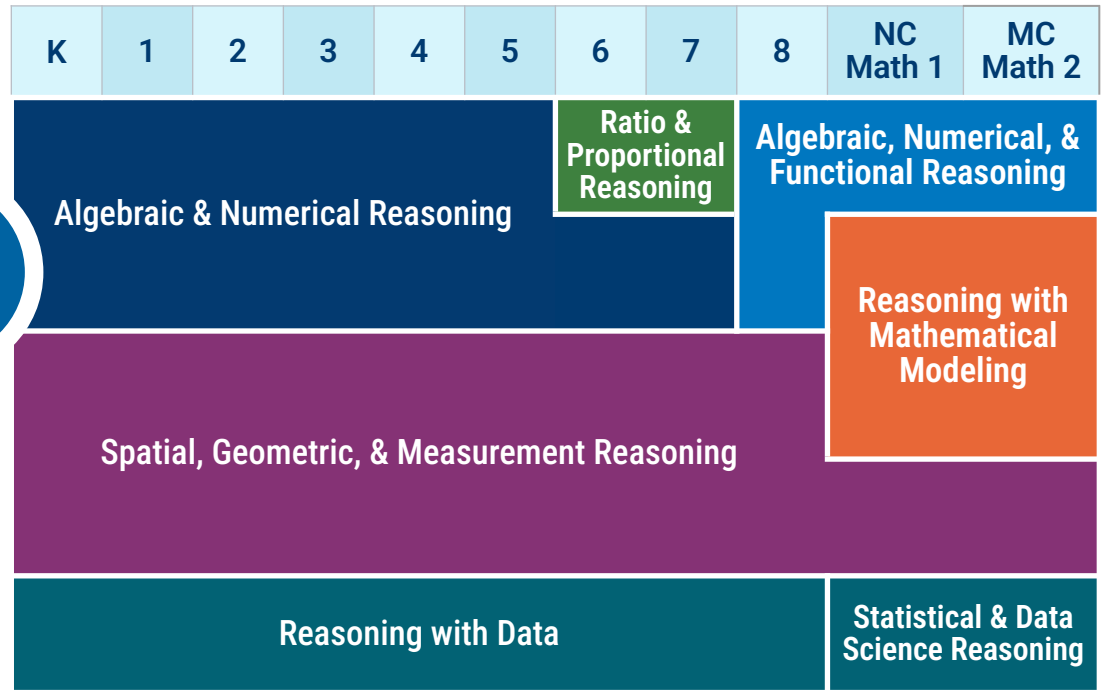


Key Changes | **Domains**

Current



Draft 3



Key Changes | **Standards for Mathematical Practice**

Standards for Mathematical Practice (SMPs)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Mathematical and Statistical Processes

Modeling and Using Tools and Representations

Ex. - Model with mathematics, use appropriate tools, use representations to examine multiple points of view

Explaining, Reasoning, and Proving

Ex. - Reason inductively and deductively, construct viable arguments and critique others

Seeing, Describing, and Generalizing Structure

Ex. - Look for and make use of structure, look for and express regularity in repeated reasoning

Productive Mathematical and Statistical Thinker

Ex. - Attend to precision, make sense of problems and persevere to solve them

Key Changes | **Vertical Alignment**

K	1	2	3
Identify and describe shapes.	**Describe and create shapes based on their defining attributes.**	**Reason with 2-D and 3-D shapes and their attributes.**	**Reason with quadrilaterals and their attributes.**
Name triangles, squares, rectangles, hexagons, circles, cubes, cones, cylinders, and spheres regardless of their orientations or overall size.	Distinguish between defining and non-defining attributes of shapes.	Compare the defining attributes of triangles, quadrilaterals, pentagons, hexagons, octagons and circles using the number of sides, vertices and angles.	Construct points, lines, line segments, and perpendicular and parallel lines.
Identify triangles, squares, rectangles, hexagons, circles, cubes, cones, cylinders, and spheres as two-dimensional or three-dimensional.	Describe the defining attributes of triangles, squares, rectangles, hexagons, and circles including the number of sides,vertices and angles.	Describe the defining attributes of cubes, rectangular prisms, pyramids, spheres, cones, and cylinders using the number of faces, edges and vertices.	Construct examples and non-examples of types of quadrilaterals including rhombuses, rectangles, squares, parallelograms, and trapezoids.
Compare two-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, attributes and other properties.	Describe the defining attributes of cubes, cones, cylinders, and rectangular prisms, including the number of faces, edges, and vertices.	Compare attributes of similar 2D and 3D shapes.	Name types of quadrilaterals including rhombuses, rectangles, squares, parallelograms, and trapezoids.
Create shapes based on their defining attributes.	Draw triangles, rectangles, squares, hexagons, and circles.		Identify points, lines, line segments, and perpendicular and parallel lines within two-dimensional figures and contextualized situations.
Draw triangles, rectangles, squares, and circles.	Build triangles, rectangles, squares, hexagons, circles, cubes, cones, cylinders, and rectangular prisms.		
Build triangles, rectangles, squares, circles, cubes, cones, spheres, and cylinders.	Compose 2D figures by combining two or more simple shapes (triangles, squares, rectangles, and/or hexagons).		
Compose larger plane figures by combining two or more simple plane figures (triangles, rectangles and/or squares).			

Key Changes | **Consistent Format for Clarity and Ease of Use**

Current

Operations and Algebraic Thinking	
Represent and solve problems involving multiplication and division	
NC.3.OA.1	**For products of whole numbers with two factors up to and including 10:** • Interpret the factors as representing the number of equal groups and the number of objects in each group. • Illustrate and explain strategies including arrays, repeated addition, decomposing a factor, and applying the commutative and associative properties.
NC.3.OA.2	**For whole number quotients of whole numbers with a one-digit divisor and a one-digit quotient:** • Interpret the divisor and quotient in a division equation as representing the number of equal groups and the number of objects in each group. • Illustrate and explain strategies including arrays, repeated addition or subtraction, and decomposing a factor.
NC.3.OA.3	**Represent, interpret, and solve one-step problems involving multiplication and division:** • Solve multiplication word problems with factors up to and including 10. Represent the problem using arrays, pictures, and/or equations with a symbol for the unknown number to represent the problem. • Solve division word problems with a divisor and quotient up to and including 10. Represent the problem using arrays, pictures, repeated subtraction and/or equations with a symbol for the unknown number to represent the problem.
Understand properties of multiplication and the relationship between multiplication and division.	
NC.3.OA.6	**Solve an unknown-factor problem by using division strategies and/or changing it to a multiplication problem.**
Multiply and divide within 100.	
NC.3.OA.7	**Demonstrate fluency with multiplication and division with factors, quotients, and divisors up to and including 10.**

Draft 3

3rd Grade	
Standards and Objectives	
Algebraic and Numerical Reasoning	
Standard 1	**Develop an understanding of multiplication with whole numbers.**
Objective 1	Interpret factors as representing the number of equal groups and the number of objects in each group for products of whole numbers with two factors up to and including 10.
Objective 2	Model strategies including repeated addition, skip-counting, decomposing a factor, and commutative property with representations for products of whole numbers with two factors up to and including 10.
Objective 3	Interpret patterns of multiplication using visual tools.
Objective 4	Represent to solve one-step contextual problems involving multiplication with factors up to and including 10.
Objective 5	Connect multiplication contextual situations with equations using a symbol for the unknown number.
Objective 6	Find the product of a one-digit whole number by a multiple of 10 in the range 10-90 by using representations, based on place value and the properties of operations.
Standard 2	**Develop an understanding of division with whole numbers.**
Objective 1	Interpret the divisor and quotient in a division equation as representing the number of equal groups and the number of objects in each group for whole-number quotients of whole numbers with a one-digit divisor and a one-digit quotient.

Current NC Student Experience in High School

Focus	Future Ready/UNC System Institution Minimum Admission Requirements	Admission into a Community College or Entering the Workforce Directly after Graduation
Required for all students*	NC Math 1	NC Math 1
	NC Math 2	NC Math 2
	NC Math 3	NC Math 3
Options Available For 4th Math credit	• NC Math 4 • Precalculus/AP Precalculus • AP Calculus • AP Statistics • Discrete Mathematics for Computer Science • Approved IB courses • Approved dual enrollment course	• AP/IB Computer Science • NCDPI - CTE course or course pairing
Example Careers	All post-secondary careers and majors requiring university level admission	• Credentials and certifications for trades, vocations • Immediate workforce entry • Community college

New Experience

- Consistent Graduation Expectations
- Essential Skills for Graduates
- Future-Ready Math Pathways

	Future Ready/UNC System Institution Minimum Admission Requirements			
Student Career Interests	Biological & Physical Sciences Engineering Mathematics Scientist Financial Management	Database Administrator Business Marketing Cybersecurity Social Sciences	Teacher Social Sciences Fine Arts Humanities Performing Arts Criminal Justice	**Admission to Community College or entering the Workforce Directly After Graduation**
Required for All Students	NC Math 1	NC Math 1	NC Math 1	NC Math 1
	NC Math 2	NC Math 2	NC Math 2	NC Math 2
Students Must Earn TWO Credits from These Courses	Mathematical & Statistical Modeling Applied Statistics & Data Science Applied Logic and Reasoning (*Formerly Discrete Math for Computer Science*)	AP Precalculus AP Statistics AP Calculus* Approved IB/Dual Enrollment course*		**Students Must Earn ONE Credit from These Courses** Mathematical & Statistical Modeling Applied Statistics & Data Science Applied Logic and Reasoning *AP/IB Computer Science*** **AND** ONE CTE Course or Course Pairing
Example Pairings	Mathematical & Statistical Modeling AP Precalculus **OR** AP Precalculus AP Calculus*	Applied Statistics & Data Science AP Statistics **OR** Mathematical & Statistical Modeling Applied Logic and Reasoning	Mathematical & Statistical Modeling Applied Logic and Reasoning **OR** Applied Statistics & Data Science Applied Logic and Reasoning	

Areas of Professional Learning

Identified Through Feedback



K-12

- Utilization of the Math Practices
- Overview of Standards
- Data Literacy/Science
- Statistics Standards



High School

- New Course Standards and Content
- Student Advising/Counseling

State and National Stakeholders

THE UNIVERSITY OF NORTH CAROLINA SYSTEM

NC STATE UNIVERSITY
Friday Institute for Educational Innovation

NC COMMUNITY COLLEGES
CREATING SUCCESS

DataScience4everyone

The University of Texas at Austin
Charles A. Dana Center

ExcelinEd

Collaboration Already Underway

Meetings with key stakeholder groups including:

- North Carolina Center for the Advancement of Teaching (NCCAT)
- Friday Institute
- North Carolina Collaborative for Mathematics Learning
- UNC System STEM Centers
- Launch Years Task Force
- North Carolina Council of Teachers of Mathematics
- Association of Mathematics Teacher Educators-NC



















2026-27 + 2027-28
School Years

Installation Phase

Communication
- PSU leadership
- Educators
- Parents
- Other Stakeholders

Professional Learning
- Regional Professional Learning
- Virtual
- DPI Staff

Support Documents
- Unpacking
- Glossary
- Crosswalk
- Parent Guides

Data Collection
- Needs Assessment
- CAO Input
- PSU Implementation Plans
- Regional Data

2028-29
School Year

Implementation Phase

Communication
- PSU leadership
- Educators
- Parents
- Other Stakeholders

Professional Learning
- Regional PD
- Virtual

Support Documents
- Based on Data from the Field

Data Collection
- Needs Assessment
- CAO Input
- Regional Data

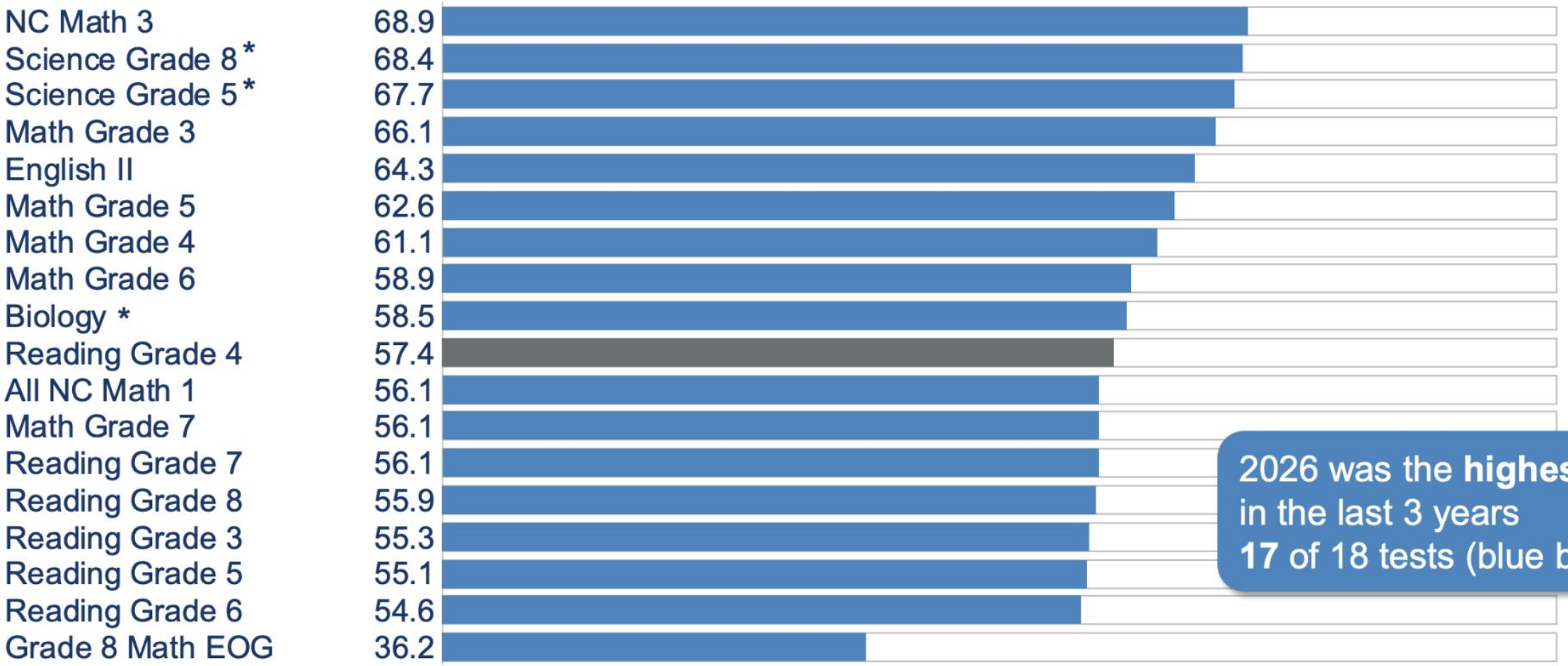
State assessments aligned to the new standards

Building on Momentum in Mathematics

What's Working and What's Reinforcing Our Direction

Grade-Level Proficiency Snapshot

Percent of students grade-level proficient by test (2026)



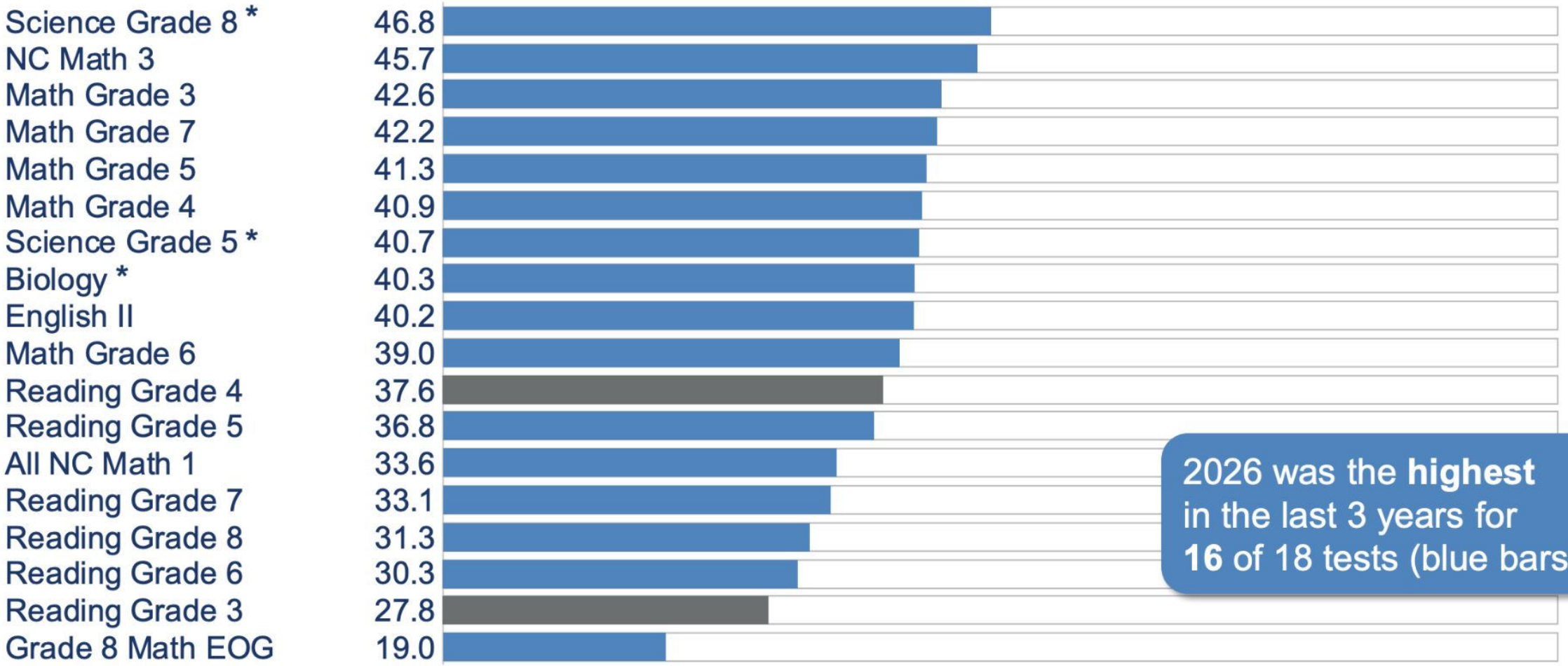
2026 was the **highest** in the last 3 years
17 of 18 tests (blue bars).

* Highest in last two years

Students who score Level 3 and above

College and Career Ready Proficiency Snapshot

Percent of students college and career ready proficient by test (2026)



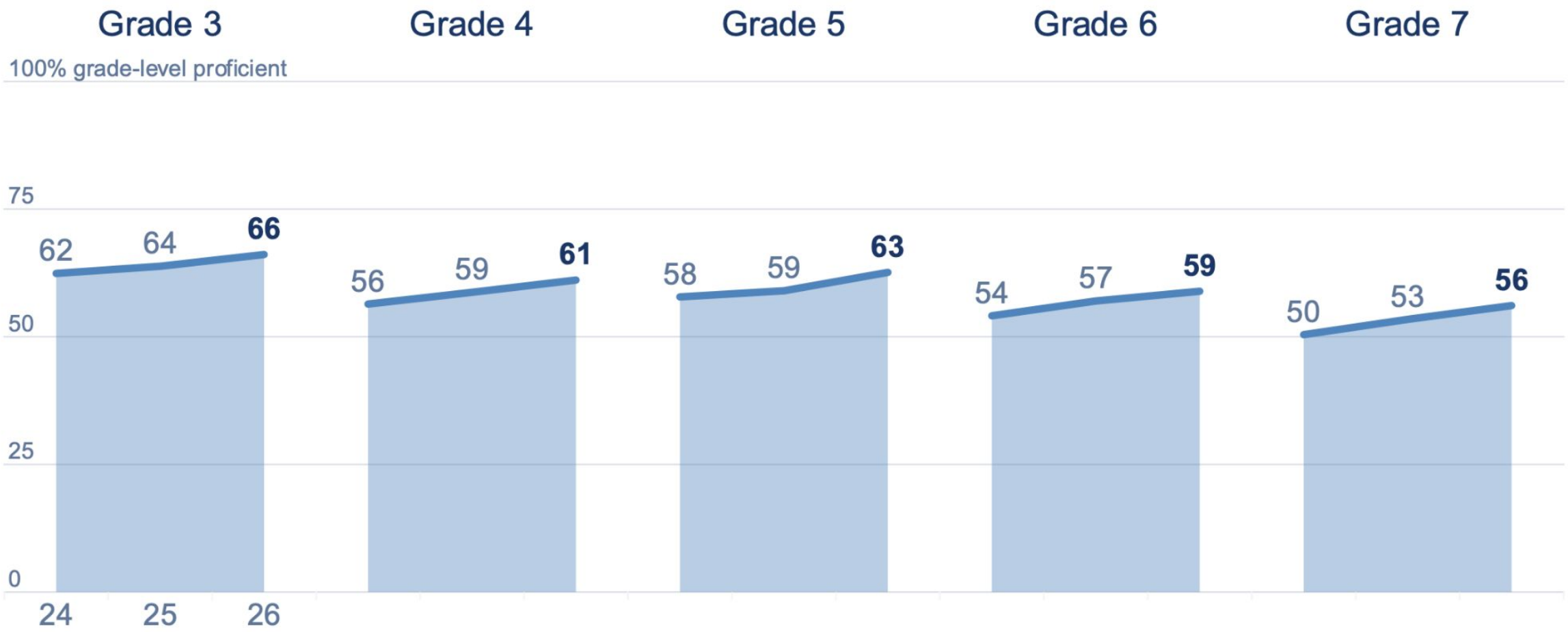
2026 was the **highest** in the last 3 years for **16** of 18 tests (blue bars).

* Highest in last two years

Students who score Level 4 and above

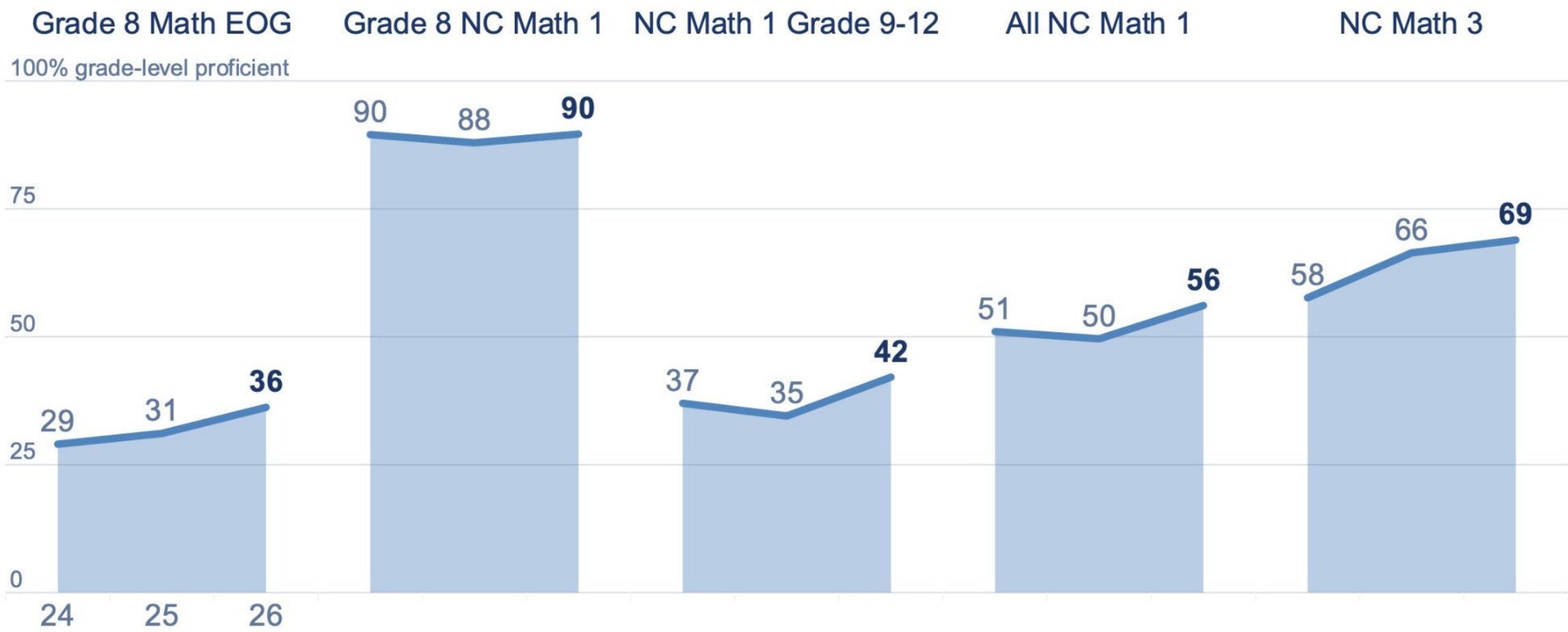
Mathematics Grades 3–7 Proficiency

Percent of students grade-level proficient by grade and year (2024, 2025, 2026)



Mathematics Grade 8 and High School

Percent grade-level proficient by tested population and year (2024, 2025, 2026)



Recent Trends in Math

State Comparisons

NAEP NORTH CAROLINA

NAEP 4th Grade



Recent Trends in Math

State Comparisons

NAEP 8th Grade



How Do We Know Our Students Are Ready for What Comes Next?



MOMENTUM TO CELEBRATE

88.8%

FOUR-YEAR GRADUATION RATE

Highest in State History



READINESS BEYOND THE DIPLOMA

23,000 +

Seniors accepted NC College Connect direct admission offers.

More than 88,000 offers accepted.

90,504

Students participated in Advanced Placement exams.

Exams earned scores of 3 or higher. **123,394**

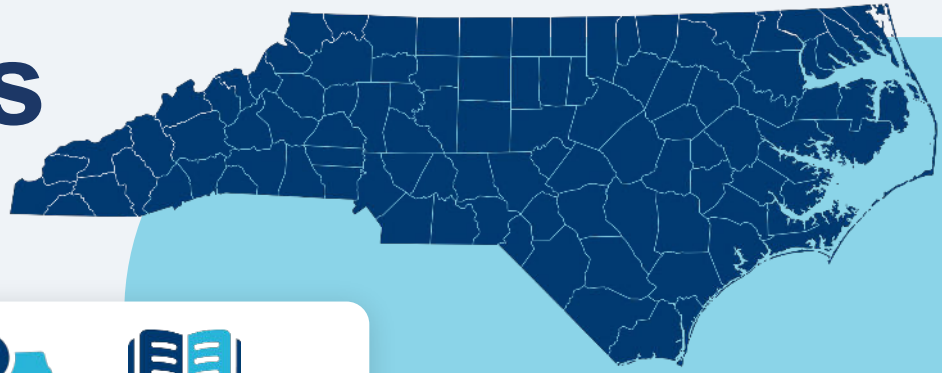
Individual CTE Credentials were earned in 24-25. **380,000 +**

Aligned with the NC Workforce Credentials List. **70,182**

Graduation tells us students completed high school.

These measures help us understand how prepared they are for what comes next.

How Momentum Becomes Sustained Excellence



Best in Nation

Use results to **identify needs.**

Strengthen standards-aligned **core instruction.**

Support implementation of **standards and high-quality instructional materials.**

Build **educator and leader capacity** and deliver **differentiated regional support.**

Monitor **implementation and student outcomes.**

Adjust, improve, and **scale what works.**



We are not launching a collection of initiatives.

We are building a coherent instructional system capable of delivering excellence for every learner.

Key Legislation and Initiatives

NCDPI and General Assembly

Launch Years Initiative



National Scope

25+ States

A multi-year national initiative transforming high school to college math transitions.

KEY PARTICIPATING STATES

Texas, Georgia, Oklahoma, Oregon, South Carolina, Utah, Washington

North Carolina Task Force

Cross-Institutional Collaboration Since Oct 2022

CORE PARTNER ORGANIZATIONS

NCDPI - UNC System - NCCCS

Broad Representation Across Sectors

- **K-12 & Local Level:** Teachers, Math Instructional Coaches, District Staff, Advisors, Counselors, NCPTA
- **State Agency (NCDPI):** Office of Teaching and Learning, Testing / Accountability, CTE, Office of Advanced Learning and Gifted Education
- **Higher Education:** UNC System Faculty & Staff, NCCCS Faculty & Staff

High Quality Instructional Materials



Textbook Commission repealed



NCDPI
is working on an **HQIM Policy** for State Board of Education consideration

K-8 High Quality Instructional Materials

The NC Collaboratory's Office of Learning Research (OLR), in consultation with DPI, mathematics researchers, and stakeholders, will identify vendors that provide:



Quality Materials

Standards-aligned, evidence-based resources that engage students, deepen understanding, and show positive results in other states.



Language Access

Opportunities for students at all language proficiency levels to communicate mathematical understanding orally and in writing.



Included Interventions

Materials supporting grade-level mathematics knowledge.



Professional Learning

Training on the materials that strengthens evidence-based mathematics instruction.

The list will be shared with PSUs by June 1, 2027. Optional for PSUs.

HQIM Purchase

OLR will acquire another state's **K–8 mathematics curriculum**, align it to North Carolina standards, and develop materials to support classroom implementation.

Year One 2026-27

- **Acquire and Adapt** the curriculum to the NC Standard Course of Study.
- **Develop** classroom instructional materials and teacher training resources.
- **Contract** with third parties to support this work.

Optional for PSUs

HQIM Purchase

Looking Ahead 2028-29

Plan for a **pilot in selected public school units**, contingent on funding.

Year Two 2027-28



Continue curriculum alignment and development of instructional and training materials.



Provide teacher professional development, as practicable.



Create an open online resource hub with teacher guides, curriculum, pacing guides, formative assessments, and revision notes.



Report to the Joint Legislative Education Oversight Committee by **June 15, 2028**, on development progress and a proposed pilot.



Pilot Initiatives

OLR will **pilot mathematics support programs across all grade levels** and compare their effectiveness, including existing high-intensity tutoring programs.

Required Partners

Accelerate Learning, Carnegie Learning, Curriculum Associates, and Zearn.

Additional Consideration

Amplify Education, MIND Education, and other promising vendors.

Implementation

OLR will establish funding guidelines, application and approval processes, reporting requirements, and procedures for program access.

Evaluation

Pilot scope will depend on available funding; comparisons will account for differences in participating districts' demographics.

Carnegie Pilot for Middle Grades

North Carolina Department of PUBLIC INSTRUCTION | CARNEGIE LEARNING

Optional Pilot

- One on-site launch day
- Five Patterns© **Proportional Reasoning** and **Data and Statistics** teacher licenses
- Five days of on-site coaching
- Patterns© leadership course access
- Pre- and post- implementation inventories

Live Learning Together Sessions

Explore mathematics, share thinking, and learn alongside fellow NC educators.

Asynchronous Learning Individual Coursework

Deepen understanding and connect learning to classroom practices.

Live 1:1 Sessions with Expert Coaches

Receive personalized support and coaching around mathematics and instruction.



Low Performing Schools

Daily Mathematics Instruction

Low-performing schools shall provide at least **60 minutes** of mathematics instruction per day in kindergarten through eighth grade that is **on or above grade level**.



Low Performing Schools

K–8 Mathematics Screening Requirements

Low-performing schools must screen **all K–8 students at least three times each school year**.

- **First screening:** Within 30 days of the start of school.
- **Purpose:** Monitor progress, diagnose difficulties, and guide instruction and remediation.
- **Use:** Screening may serve as a summative assessment only when required for federal grants.

The State Board of Education will adopt and provide a **valid, reliable screening assessment aligned with North Carolina standards and statutory requirements.**



Low Performing Schools

Assessment Tools, Results, and Support

DPI will select a vendor through an RFP process. The vendor must:

- **Provide** a valid, reliable, standards-aligned assessment.
- **Give** teachers and administrators access to progress monitoring tools.
- **Share** results with teachers and parents within **15 calendar days**.
- **Identify** students needing intervention and report results to DPI.

DPI, in consultation with the vendor, will provide guidance and professional development to help educators use screening data to inform classroom instruction and plan student interventions.



Low Performing Schools

Mathematics Success Plans - Who and When

Low-performing schools must develop and implement a **Mathematics Success Plan (MSP)** for K–8 students showing substantial difficulty in mathematics on the first screening of the school year or second semester.

- **Duration:** Continue through eighth grade or until the student demonstrates grade-level proficiency on a mathematics end-of-grade exam, whichever comes first.
- **Family notification:** Notify parents or guardians of the identified difficulty and the development of an MSP.
- **Ongoing review:** Regularly adjust the plan when data show insufficient progress toward grade-level proficiency.



Low Performing Schools

Mathematics Success Plans - Required Components

Each MSP must use current student data to identify:

- Specific mathematics skill gaps.
- Growth goals and benchmarks.
- Methods for monitoring and evaluating progress.
- Additional mathematics interventions.
- Other services the teacher identifies to accelerate learning.

MTSS option: Schools may meet these requirements through an **MTSS intervention** that includes all five components.

DPI support: DPI will develop an **MSP checklist** and an **alternative MTSS compliance document**.



Khan Academic Support Program

Provides public school units with funding to contract with Khan Academy for Khanmigo in grades 6–12.

Participation: PSUs opt in through a DPI process and request funding for licenses.

Khanmigo is Khan Academy's AI-powered tutor and teaching assistant. It supports both student learning and teacher planning.

- **For students:** Provides interactive guidance, questions, and feedback to help them work through problems and understand concepts across subjects, including mathematics, science, writing, and history.
- **For teachers:** Helps create lesson plans, differentiated activities, rubrics, quiz questions, and exit tickets.



Magic School Academic Support Program

Provides public school units with funding to contract with Magic School for grades 6–12.

Participation: PSUs opt in through a DPI process and request funding for licenses.

Magic School is an AI platform designed for K–12 educators and students. It provides tools to support instructional planning, classroom work, and student learning.

- **For teachers:** Helps create lesson plans, assessments, rubrics, differentiated materials, student feedback, and family communications.
- **For students:** Offers teacher-directed AI activities through “Student Rooms,” where teachers select tools and monitor student interactions.

Resources to Reference

Strategic Plan

Internal Procedures for Standards Revision Manual

NCDPI listservs

Office of Teaching and Learning website

Questions?

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