Permission to Revise: K-12 Mathematics

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North Carolina Department of
PUBLIC INSTRUCTION

Purpose

Overview

- Current Context for Math
- Math Landscape in NC

Data & Research

- Research
- Data Collection Process
- Data Review Committee (DRC) Initial Analysis and Recommendations

Next Steps

- Permission to Revise
- Revision Timeline

State Board Policy SCOS-012

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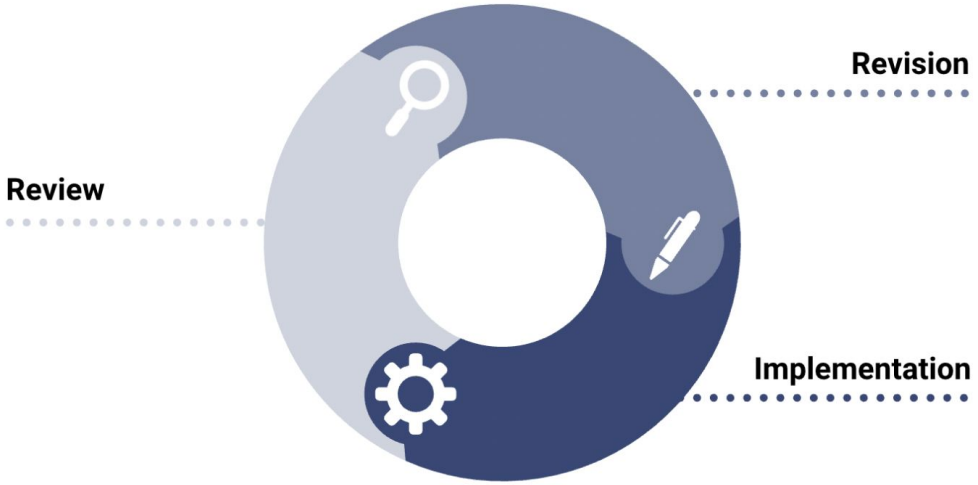
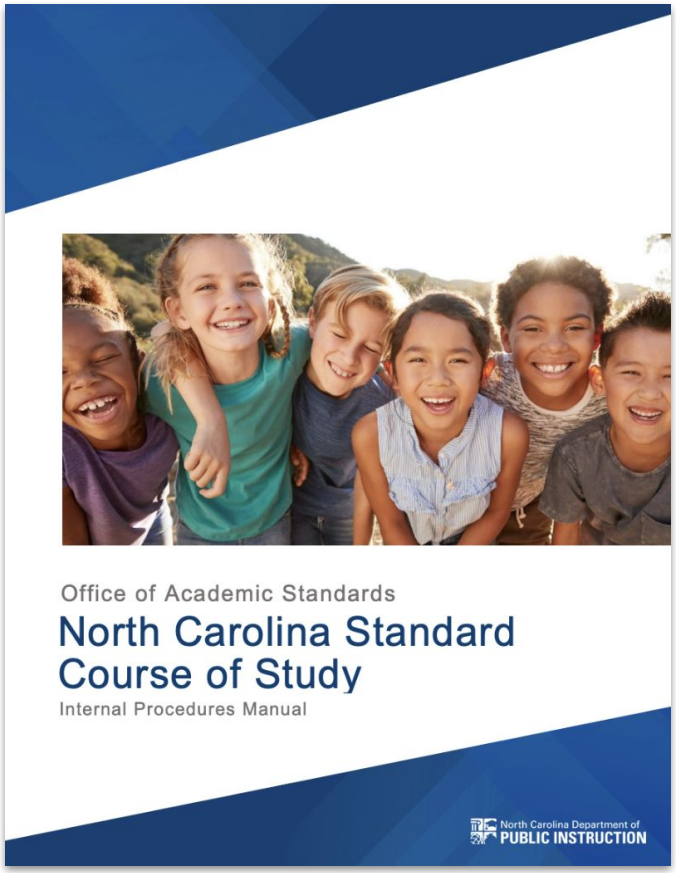
- NCDPI facilitates the review of each set of content standards every five-to-seven years to ensure clear, relevant standards and objectives.
- NCDPI uses a uniform and formalized system built on four guiding principles:
  - Feedback-based
  - Research-informed
  - Improvement-oriented
  - Process-driven



Internal Procedures Manual

Pages 11-17



Current Context for Conversations about Math

Math is Essential in NC and Beyond

Advanced Manufacturing and Textiles

Biomedicals/Pharmaceuticals

High Tech Agriculture

Personal Finance/Financial Services

Construction/Architecture

Mathematical Literacy is a Necessity

The Culture/Climate Around Math

- “I’m not a math person”
- “It’s okay, math is hard”
- “Why do I need to learn this? When am I going to use this?”

- Current approach to K-12 Math is a “one size fits all” based on a presumption all students need calculus

Questions around Math

What Math does EVERY graduate **need** to know? What Math does EVERY graduate **want** to know?

- How can we increase proficiency for all students in math?
- How can we increase the application of math content in our classrooms?
- How can we increase student interest in math?

Math Pathways/Launch Years Initiative

- A three-year initiative with 20+ states including Texas, Georgia, Oklahoma, Utah, Washington, Maryland, and Ohio

- A joint-task force between NCDPI, UNC-System and NCCCS working together since October, 2022
  - Representatives from all three institutions including teachers, math instructional coaches, district staff, advisors, counselors, NCDPI staff (OAS, Testing/Accountability, CTE), UNC System faculty and staff, NCCCS faculty and staff, NCPTA
  - Seeking better alignment and clear connections between K-12 instruction, workforce development, and postsecondary options
  - Drafting recommendations covering advising, teacher training, possible new course options, increased communication between all three institutions, and clearer communication for parents/students

Landscape of Math in NC

Recent Trends in Math (3rd-8th Grade)

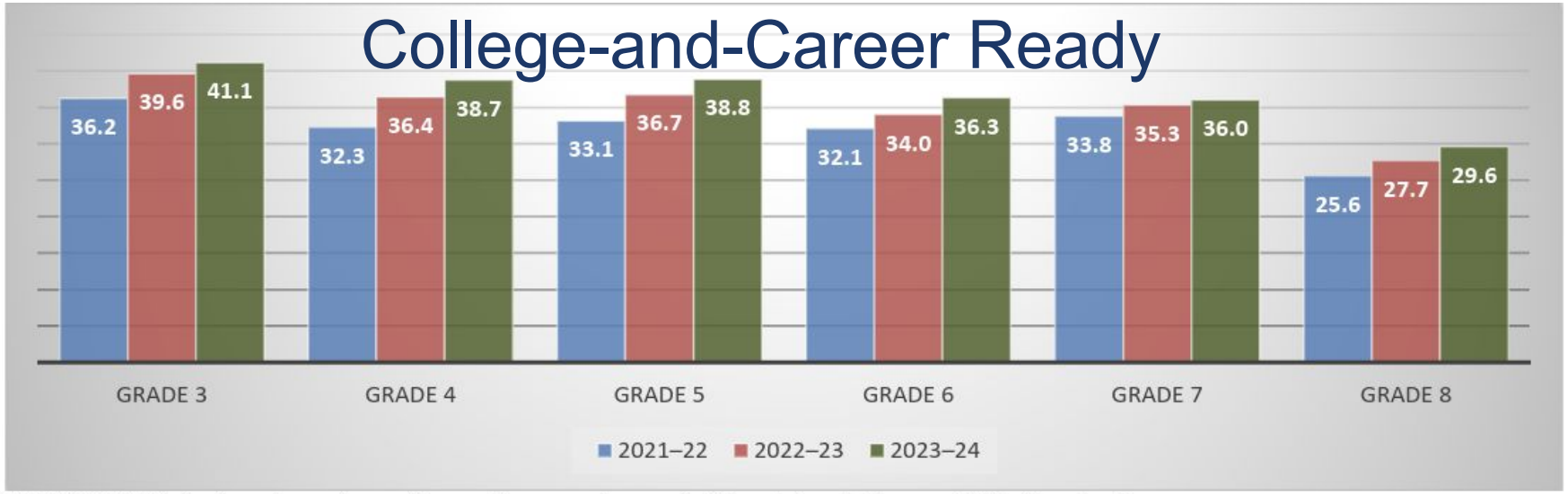


FIGURE 3. End-of-grade mathematics performance by grade (Level 4 and above—CCR Standard).

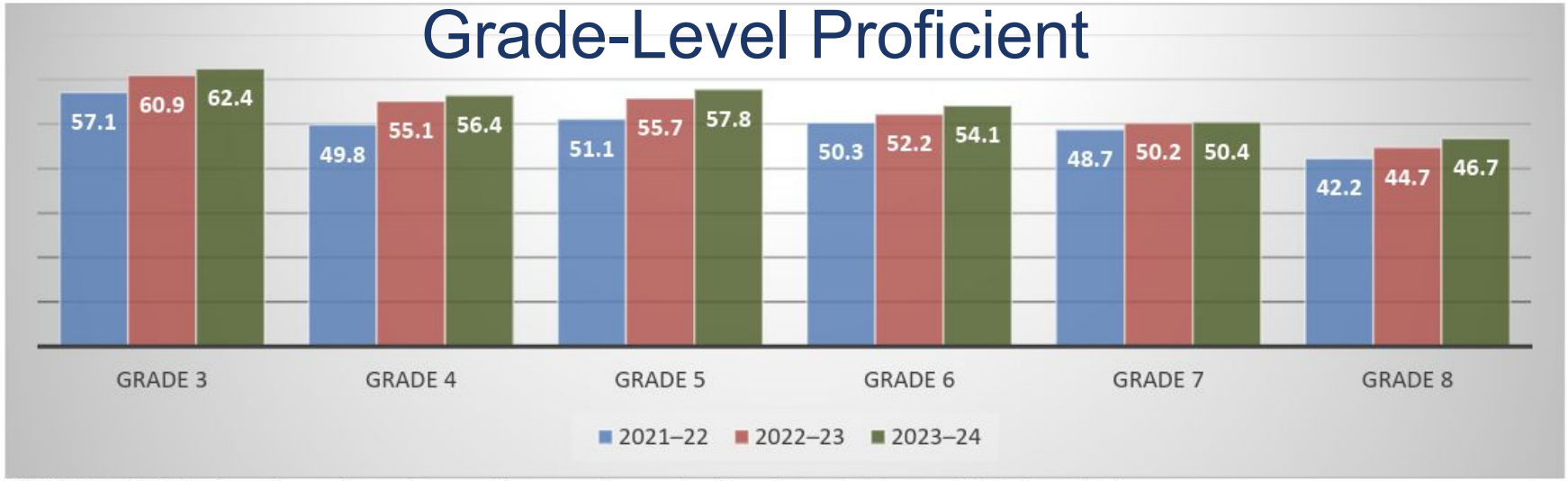


FIGURE 4. End-of-grade mathematics performance by grade (Level 3 and above—GLP Standard).

Recent Trends in Math (High School)

29.3% of 8th grade students took Math 1 in 2023-2024

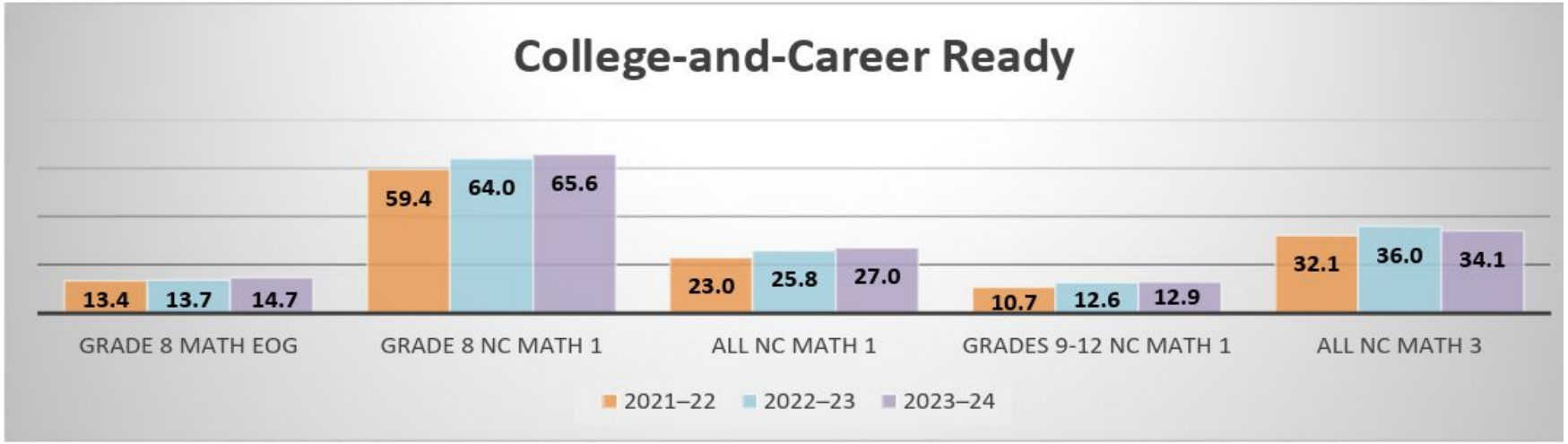


FIGURE 7. Mathematics end-of-grade and end-of-course performance information at grades 8–12 (Level 4 and above—CCR Standard).

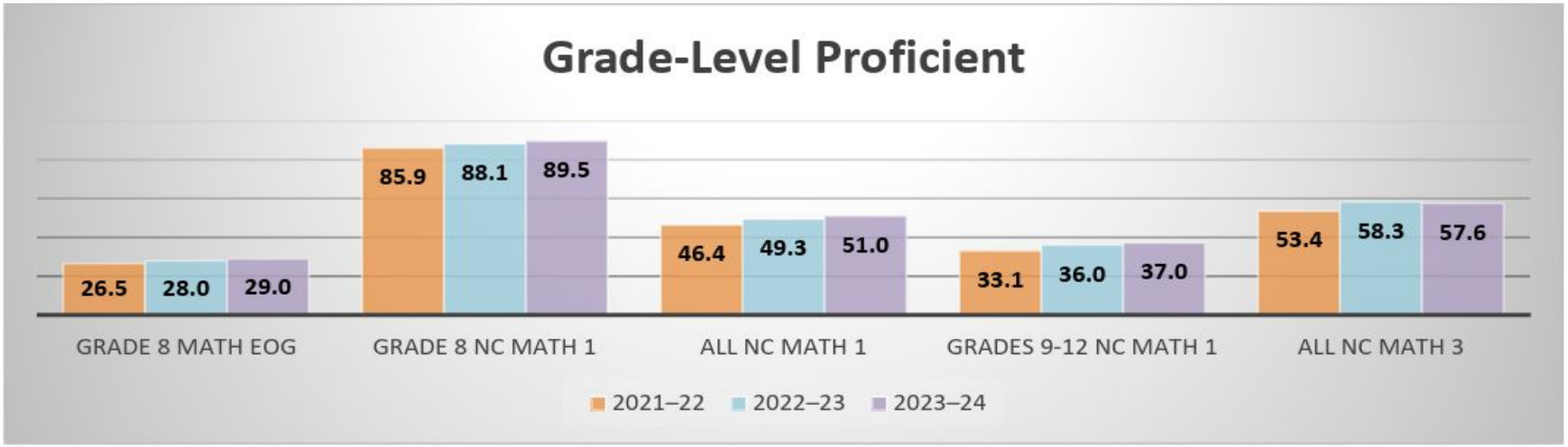


FIGURE 8. Mathematics end-of-grade and end-of-course performance information at grades 8–12 (Level 3 and above—GLP Standard).

NC K-12 Math Standards

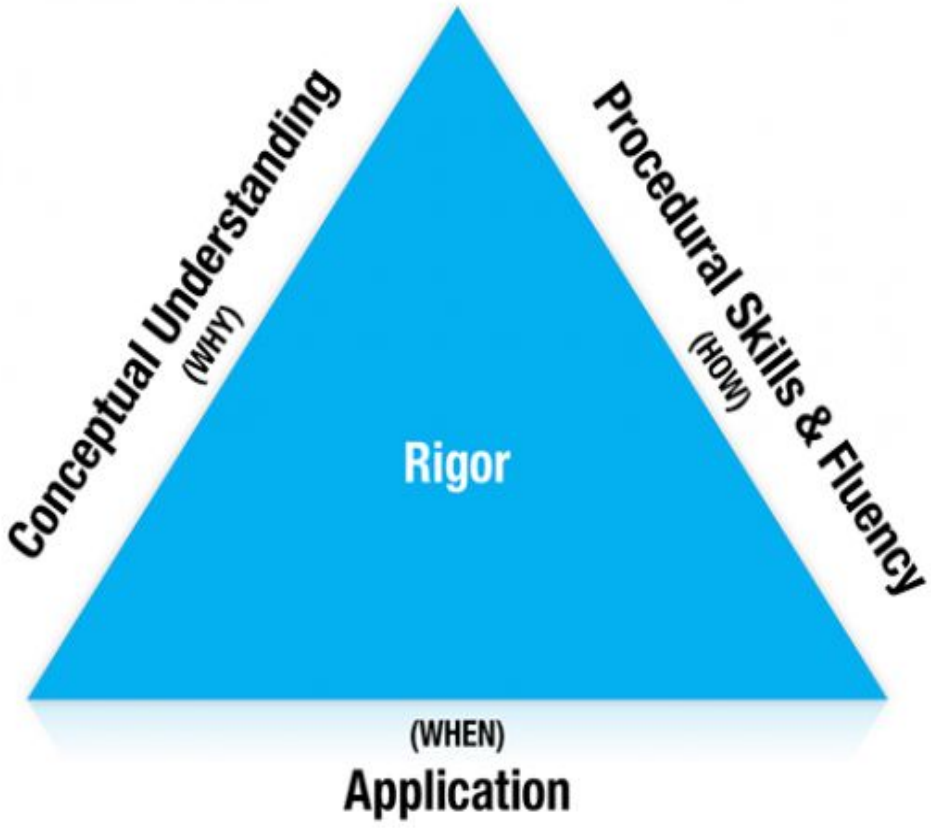
- NC students are required to have 4 **credits** of high school math to graduate
  - 3 of those credits must* be Math 1, 2, and 3
  - Students have some choice in the fourth math option, but not all choices meet entrance requirements for the UNC System
  - UNC System requires 4 **levels** of math for admission
- Current standards adopted in 3 phases
  - NC Math 1, 2 and 3 in 2016
  - Kindergarten - Eighth Grade in 2017
  - NC Math 4, Discrete Mathematics for Computer Science, and Precalculus in 2019

NC K-12 Math Standards

Built on a foundation of 3 key legs:

- Procedural Fluency
- Conceptual Understanding
- Application

To use math successfully, a student must know how to do it, why, and when.



NC K-12 Math Standards - More Than Just Content

NC K-12 Standards for Mathematical Practice

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

Data Review Committee

Analysis and Recommendations

Review Phase Timeline

January - October 2024

Standards Research & Legislation Review

Surveys Released

Focus Groups & Interviews Completed

November 2024 - December 2025

Surveys Closed

Analysis of all stakeholder feedback completed

DRC applications open and members selected

January - February 2025

DRC Selected & Work Began

February - March 2025

DRC review of research and stakeholder feedback completed

Data Review Committee

- 24 members
- Members from all 8 SBE regions
- Classroom teachers, instructional coaches, school/district administrators, IHE faculty
- Grade span teams

Release application
Establish criteria for knowledge of K-12 math standards, vertical alignment and previous use of data

Blind Selection
Applications reviewed by K-12 Math Consultants and internal agency members

Final Selection
Contact supervisors; select final members

Confirm DRC
Accepted DRC notified

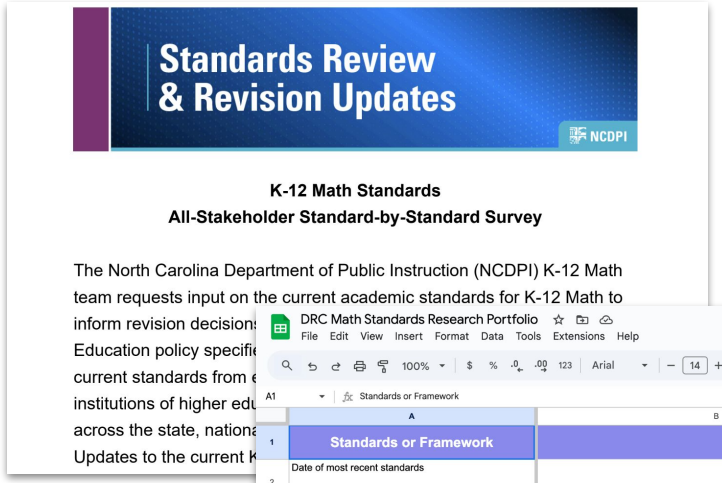
Data Collection

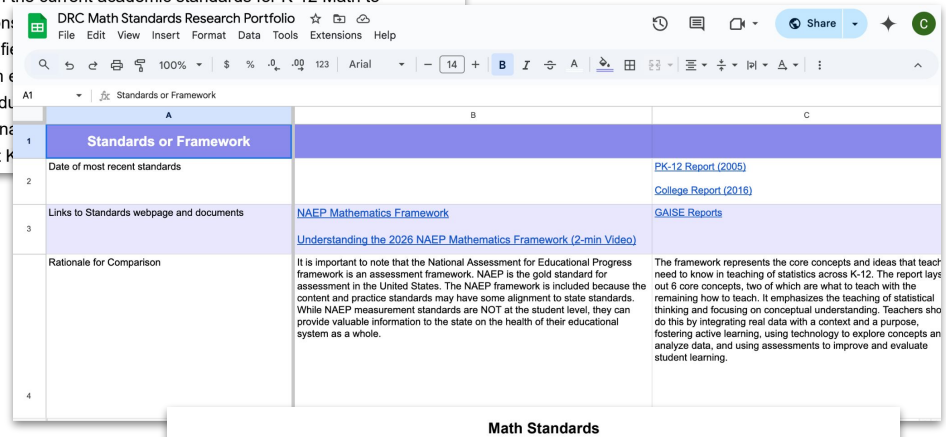
79%
96 LEAs Responded to the PSU Standard-by-Standard

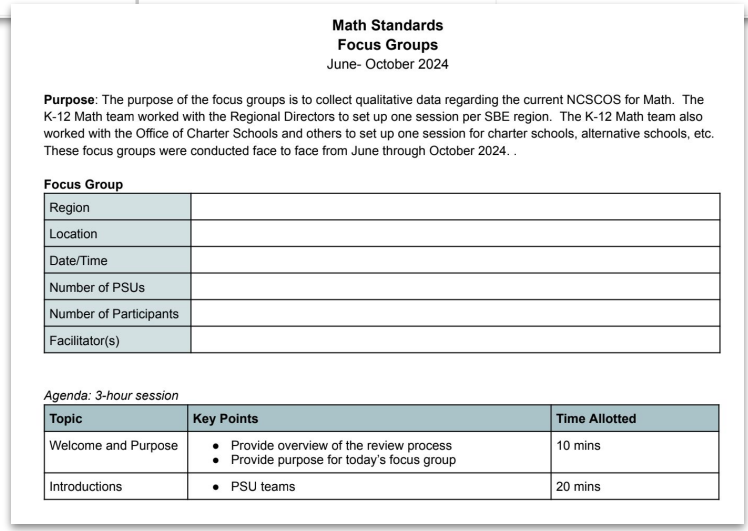
2,644
All-Stakeholder Standard-by-Standard Responses

3,126
General All-Stakeholder Survey Responses

188
Focus Group Participants & Interviewees

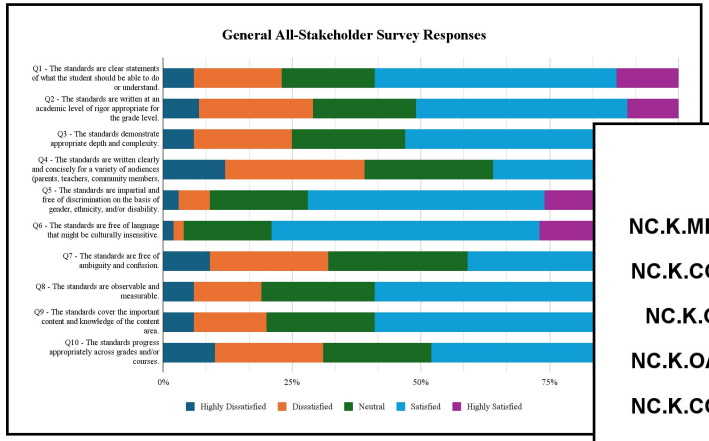


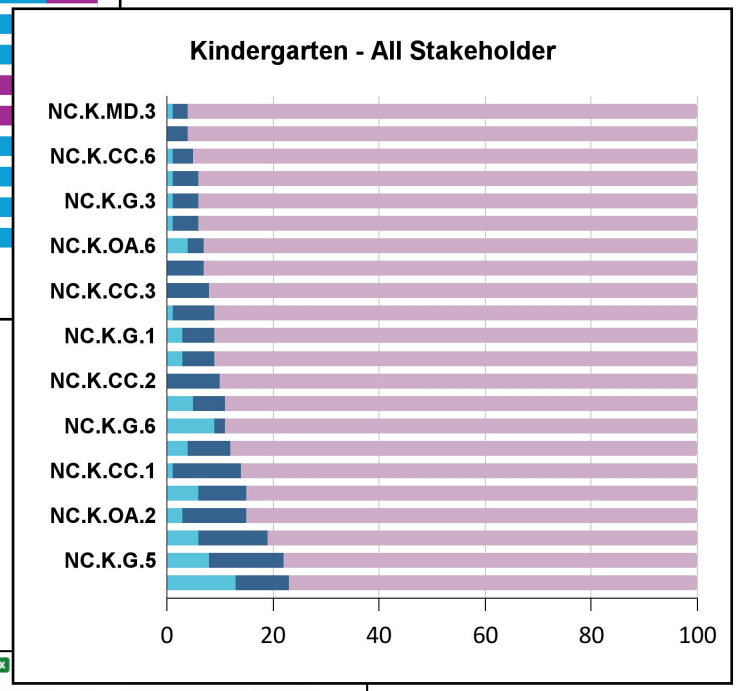


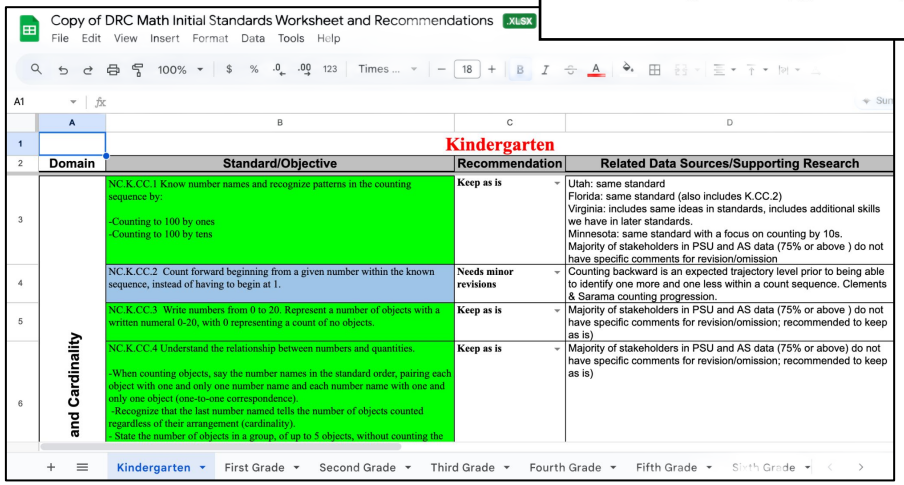


Data Review Committee

- Analyze Data & Research
- Complete Spreadsheet
- Complete Data Report







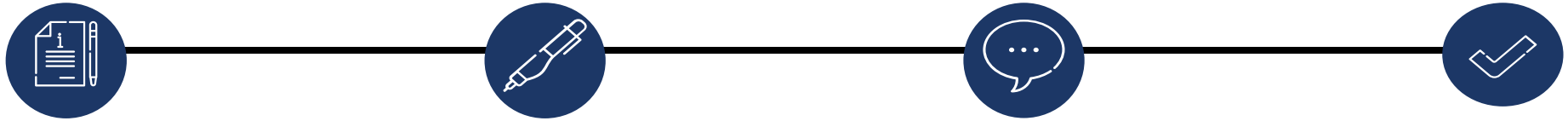
Data Review Committee Key Findings

- 410 out of 474 objectives had a 75% or higher approval rate on the All-Stakeholder survey
- 395 out of 474 objectives had a 75% or higher approval rate on the PSU survey
- Standards are viewed to have gaps in vertical alignment with some concepts needing greater/lesser weight
- Standards are often not clear or easy to understand
- Breadth of what all students are required to learn is too broad
- Need to emphasize foundational math skills and career relevance

Data Review Committee Recommendations

- Implement high school math pathways to connect student postsecondary aspirations to their math courses
- Narrow the scope of standards across K-8 and NC Math 1/Math 2 to distinguish essential knowledge all graduates need from additional concepts connected to postsecondary interest
- Maintain 4 credit requirement with NC Math 1 and NC Math 2
- Increase the role of statistics and data science
- Adopt AP Precalculus framework to replace current NC Precalculus standards and significantly revise NC Math 3 and NC Math 4
- Ensure parity between procedural fluency, conceptual understanding and application across all grades and courses

Tentative Timeline for Revision Phase



April - May 2025

Open Standards Writing Team (SWT) Application

SWT Selection

Aug - Oct. 2025

Draft 1 Complete

Draft 1 Released for Feedback

Jan. - March 2026

Draft 2 Completed

Draft 2 Released for Feedback

April - May 2026

Draft 3 Completed

Tentative Timeline for Implementation

Installation Phase (2026-2027 School Year)

- Publish new standards, crosswalks, support documents
- Provide training for district/school leads, then classroom teachers
- Design any new assessments

Implementation Phase (Begin with 2027-2028 School Year)

- New standards go into effect for classroom instruction and assessments
- Continue professional development

Questions?