

Permission to Revise: K-12 Mathematics

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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

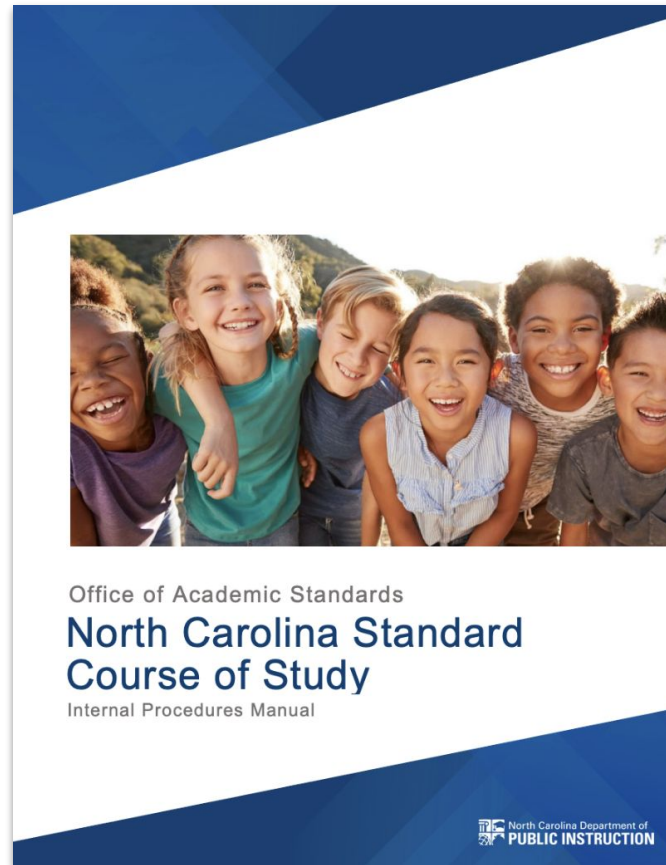
State Board Policy SCOS-012

- 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



Construction/Architecture



Personal Finance/Financial Services

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)

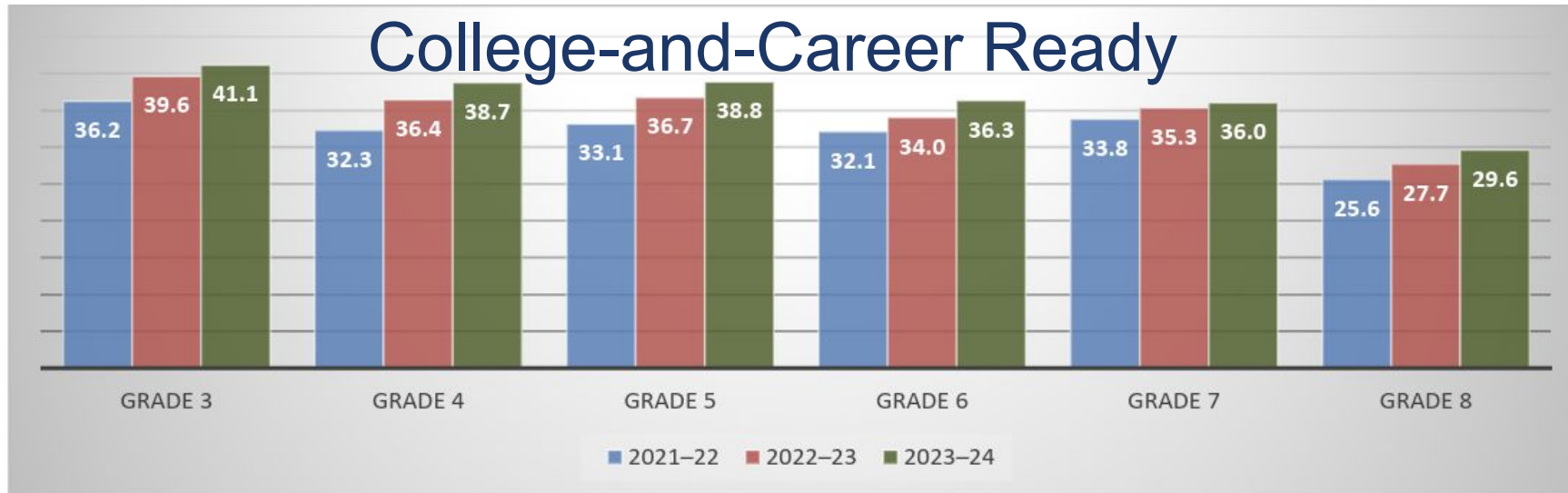


FIGURE 3. End-of-grade mathematics performance by grade (Level 4 and above—CCR Standard).

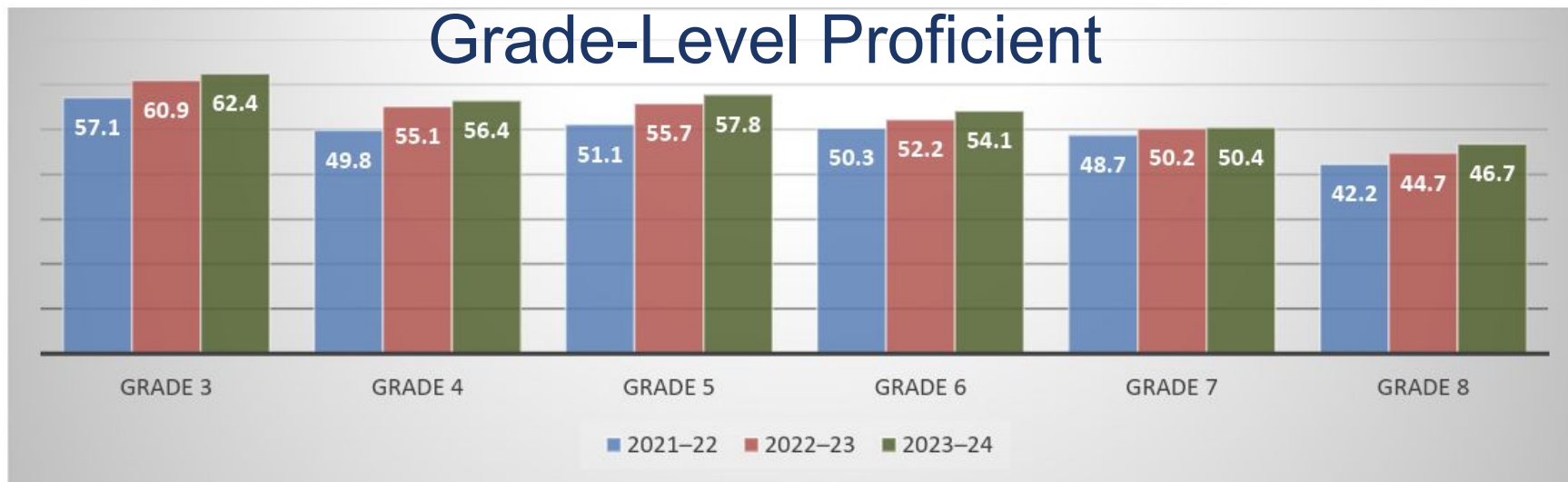


FIGURE 4. End-of-grade mathematics performance by grade (Level 3 and above—GLP Standard).

Recent Trends in Math (High School)

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

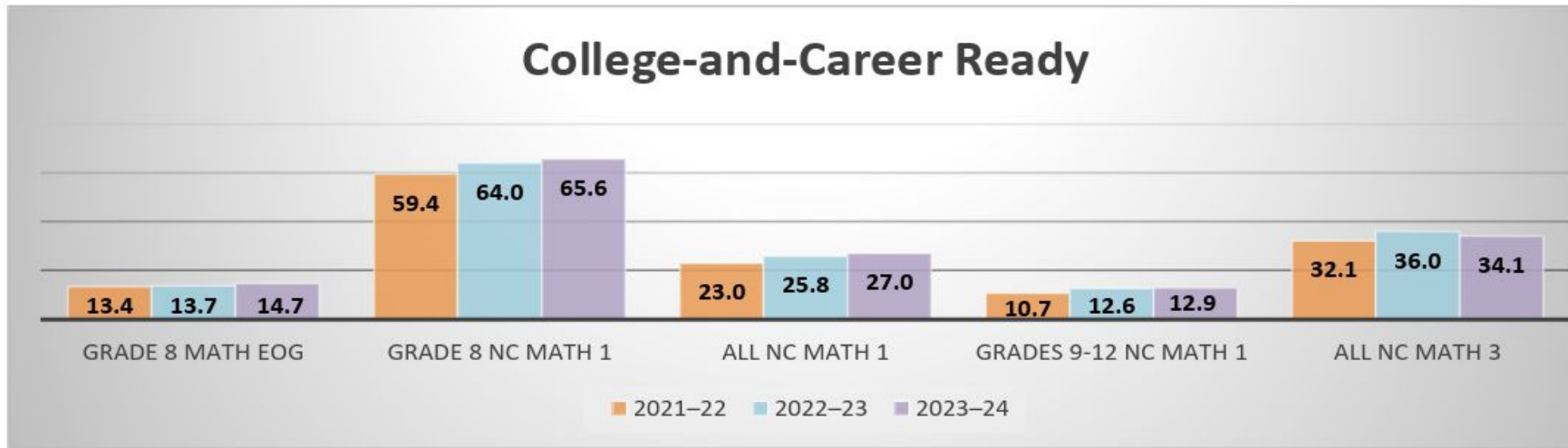


FIGURE 7. Mathematics end-of-grade and end-of-course performance information at grades 8–12 (Level 4 and above—CCR Standard).

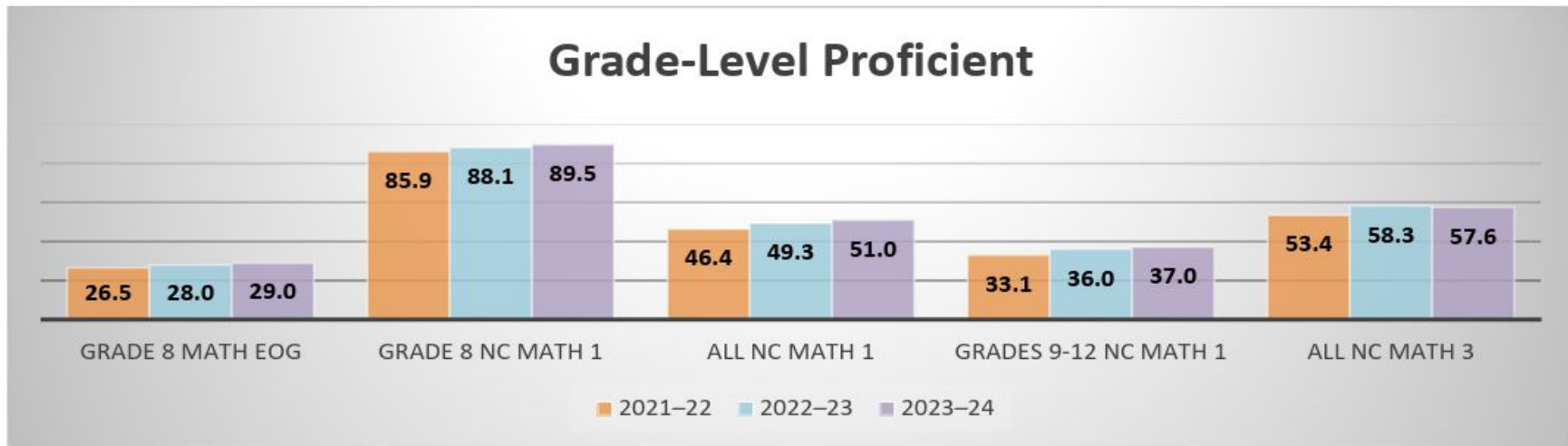


FIGURE 8. Mathematics end-of-grade and end-of-course performance information at grades 8–12 (Level 3 and above—GLP Standard).

NC K-12 Math Standards

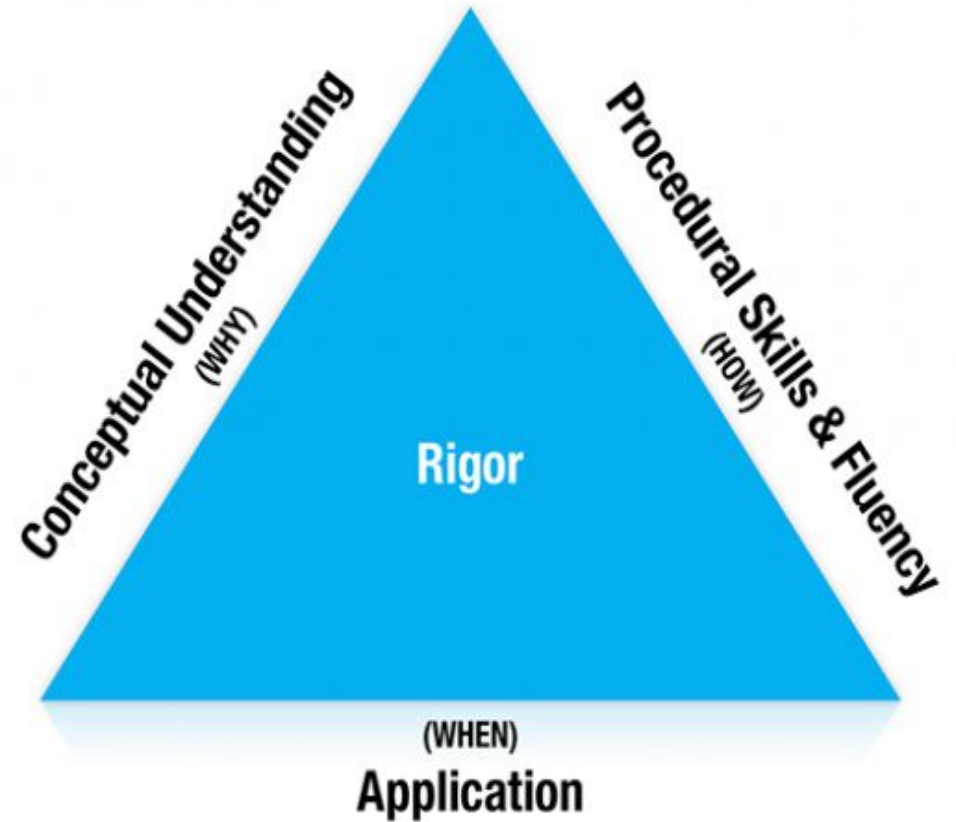
- NC students are required to have 4 **credits** of high school math to graduate
 - 3 of those credits must* be Math 1, 2, and 3
 - Students have some choice in the fourth math option, but not all choices meet entrance requirements for the UNC System
 - UNC System requires 4 **levels** of math for admission
- 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

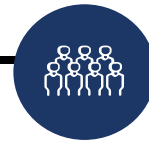


**November 2024 -
December 2025**

Surveys Closed

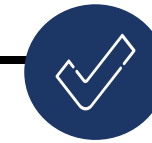
Analysis of all
stakeholder feedback
completed

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

Standards Review & Revision Updates

K-12 Math Standards
All-Stakeholder Standard-by-Standard Survey

The North Carolina Department of Public Instruction (NCDPI) K-12 Math team requests input on the current academic standards for K-12 Math to inform revision decisions. Education policy specifies current standards from institutions of higher education across the state, national Updates to the current K

Math Standards Focus Groups
June- October 2024

Purpose: The purpose of the focus groups is to collect qualitative data regarding the current NCSCOS for Math. The K-12 Math team worked with the Regional Directors to set up one session per SBE region. The K-12 Math team also worked with the Office of Charter Schools and others to set up one session for charter schools, alternative schools, etc. These focus groups were conducted face to face from June through October 2024. .

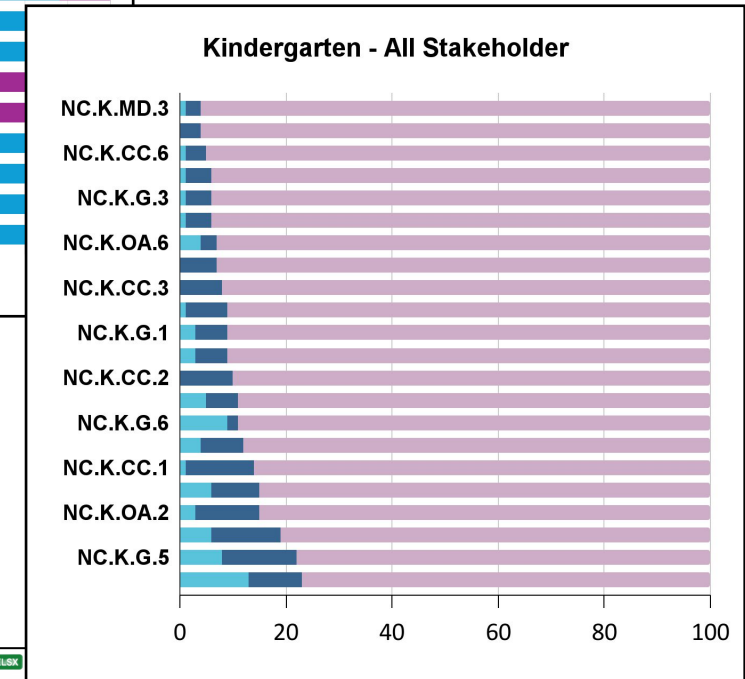
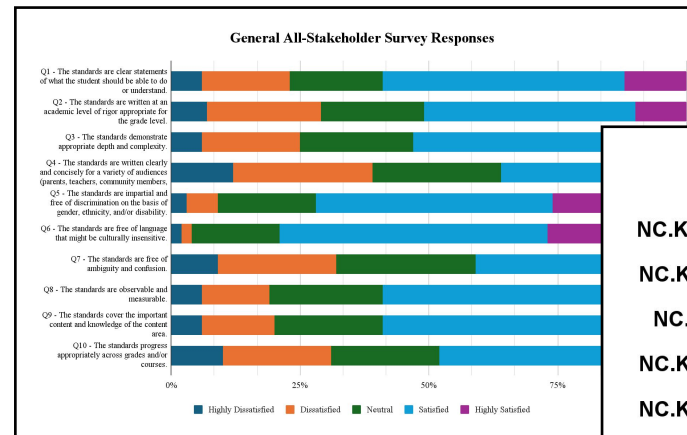
Focus Group	
Region	
Location	
Date/Time	
Number of PSUs	
Number of Participants	
Facilitator(s)	

Agenda: 3-hour session

Topic	Key Points	Time Allotted
Welcome and Purpose	<ul style="list-style-type: none"> Provide overview of the review process Provide purpose for today's focus group 	10 mins
Introductions	<ul style="list-style-type: none"> PSU teams 	20 mins

Data Review Committee

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



Copy of DRC Math Initial Standards Worksheet and Recommendations

Kindergarten			
Domain	Standard/Objective	Recommendation	Related Data Sources/Supporting Research
and Cardinality	NC.K.CC.1 Know number names and recognize patterns in the counting sequence by: -Counting to 100 by ones -Counting to 100 by tens	Keep as is	Utah: same standard Florida: same standard (also includes K.CC.2) Virginia: includes same ideas in standards, includes additional skills we have in later standards. Minnesota: same standard with a focus on counting by 10s. Majority of stakeholders in PSU and AS data (75% or above) do not have specific comments for revision/omission
	NC.K.CC.2 Count forward beginning from a given number within the known sequence, instead of having to begin at 1.	Needs minor revisions	-Counting backward is an expected trajectory level prior to being able to identify one more and one less within a count sequence. Clements & Sarama counting progression.
	NC.K.CC.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20, with 0 representing a count of no objects.	Keep as is	Majority of stakeholders in PSU and AS data (75% or above) do not have specific comments for revision/omission; recommended to keep as is)
	NC.K.CC.4 Understand the relationship between numbers and quantities. -When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object (one-to-one correspondence). -Recognize that the last number named tells the number of objects counted regardless of their arrangement (cardinality). -State the number of objects in a group, of up to 5 objects, without counting the	Keep as is	Majority of stakeholders in PSU and AS data (75% or above) do not have specific comments for revision/omission; recommended to keep as is)

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?

