**NCSIP Reading Foundations Crosswalk**

NC SIP Foundations of Mathematics /Pearson General Curriculum Mathematics Subtest

Crosswalk

The purpose of this document is to show the alignment between the required North Carolina Pearson for General Curriculum Mathematics Subtest and the NC Department of Public Instruction State Improvement Project’s (NC SIP) *Foundations of Math* professional development. *Foundations of Math (FoM)* is a 30-hour in-service course that has been offered by certified instructors in Local Education Agencies across NC since 2006. Institutions of Higher Education (IHE), that partner with NC SIP, are infusing FoM concepts into pre-service coursework. Professors, who have become instructors through the required NC SIP certification process, are delivering these changes in coursework.

This crosswalk shows that the course goals and competencies of NC SIP *Foundations of Math* are closely aligned to the concepts and skills in the NC Pearson General Curriculum Mathematics Subtest Practice Test**.** A review conducted by IHE partners and DPI found that *Foundations of Math* concepts taught aligned to 75 % of NC Person General Curriculum Mathematics Subtest Practice Test items. This crosswalk is to be used as a resource and to provide a framework for the content and rigor required to successfully prepare for the Pearson General Curriculum Mathematics Subtest.

See: [www.nc.nesinc.com](http://www.nc.nesinc.com/) for more information about the Pearson General Curriculum Mathematics Subtest.

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| **Foundations of Mathematics****Course Goals and Competencies** | **NC Pearson:****General Curriculum Mathematics Subtest/Practice Test Items** |
| **Unit 1: Introduction**1. Understand the purpose and rationale of Foundations of Mathematics
2. Understand the drivers that support the implementation and sustainability of research-based practices within a school.
3. Review the traditional role that curricular materials have played in mathematics reform.
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| **Unit 2: Research to Practice**1. Understand international comparative research that highlights performance discrepancies and apply implementation choices (including conceptual connections) and pedagogical practices that emerged through the qualitative examination of high achieving countries

 1. Understand longitudinal trends and recent national and state-level assessment data that highlight the mathematical proficiencies of US and NC students

 1. Understand and apply a prototype for lesson construction that synthesizes the work of Cecil Mercer (Concrete-Representational-Abstract) and Sharon Griffin (Quantity, Structure, Symbolic)
2. Understand and apply converging empirical support for the mutually reinforcing pairing of conceptual understanding and procedural efficiency
 | **Test Objectives and Associated Practice Items:**0024 Understand and apply concepts of geometryItem: 36, 400020 Understand algebra as generalized arithmeticItem: 24 |
| **Unit 3: Mathematical Knowledge for Teaching**1. Analyze and evaluate the work of Liping Ma that highlights the differences in content knowledge and pedagogical practices between US and Chinese teachers
2. Understand the base-ten system and the implications for standard and alternative computation algorithms
3. Understand and apply concrete and representational models of addition, subtraction, multiplication, and division of rational numbers
4. Understand the relationship between area and perimeter
5. Understand and apply properties associated with addition, subtraction, multiplication, and division
 | **Test Objectives and Associated Practice Items:**0016 Understand the number system and the concept of place valueItems: 1, 3, 4, 50017 Understand integers, fractions, decimals, percent, and mixed numbersItem: 60018 Understand and apply principles of number theoryItem: 150019 Understand operations on numberItems: 16, 17, 18, 190023 Understand and apply concepts of measurementItems: 32, 34, 35 |
| **Unit 4: Components of Number Sense**1. Understanding and applying connections across the components of number sense
2. Understand and apply the critical role of language in developing conceptual understanding and contextualizing / decontextualizing symbolic representations of mathematics
3. Understand the relationships between percent, fractions, ratios, and decimals
4. Understand the value and limitations of different forms of a data
 | **Test Objectives and Associated Practice Items:**0017 Understand integers, fractions, decimals, percent, and mixed numbersItem: 7, 9,100025 Understand descriptive statisticsItem: 420026 Understand and apply basic concepts of probabilityItem: 43 |
| **Unit 5: Quantity, Magnitude, and Numeration**1. Understand and apply the concepts of quantity and magnitude
2. Understand and apply the concept of abstraction and how it relates to the unit
3. Understand and apply how the mind processes quantity and connects to the symbolic / digital number system
4. Understand and apply quantity to the visual representation of number lines
5. Understand and evaluate assessment data related to a child’s understanding of quantity, magnitude, numeration, and base-ten
6. Understand, recognize, and intervene on difficulties with quantity and magnitude
7. Apply concrete representations of quantity to develop conceptual understanding of equality and the solving of algebraic equations
8. Understand the cognitive processes associated with mathematical problems solving
9. Understanding the underlying structures of common computation situations
10. Understanding and applying definition and concept on numeration
11. Understanding, recognizing, and intervening on numeration difficulties
 | **Test Objectives and Associated Practice Items:**0016 Understand the number system and the concept of place valueItem: 40017 Understand integers, fractions, decimals, percent, and mixed numbersItems: 7, 8, 100018 Understand operations on numbers Item: 160020 Understand algebra as generalized arithmeticItems: 21, 22, 24 0025 Understand descriptive statisticsItem: 410026 Understand and apply basic concepts of probabilityItems: 43, 44, 45 |
| **Unit 6: Equality, Base Ten, and Form of a Number**1. Understand the relationship between the structures of equality and the computation situations for addition, subtraction, multiplication, and division
2. Understand and apply the concepts of the base ten system and instructional implications
3. Understand Sharon Griffin’s developmental nature of children using two number lines
 | **Test Objectives and Associated Practice Items:**0016 Understand the number system and the concept of place valueItem: 20017 Understand integers, fractions, decimals, percent, and mixed numbersItems: 7, 90020 Understand algebra as generalized arithmeticItem: 23 |
| **Unit 7: Proportional Reasoning** 1. Understand and apply the concept of a multiplicative relationship between two quantities
2. Understand and apply functional and scalar relationships within and between ratios
3. Understand and apply the developmental and cognitive progression of proportional reasoning concepts
4. Understand and respond to the major issues that hinder proportional reasoning in students
5. Explore and apply non-numeric examples of proportional reasoning
6. Understand pi as a ratio of diameter to circumference
7. Understand that the functional relationship of a ratio results in a constant rate of change that can be graphed on a Cartesian Plane
 | **Test Objectives and Associated Practice Items:**0016 Understand the number system and the concept of place valueItems: 4, 50020 Understand algebra as generalized arithmeticItem: 230021 Understand the concept of functionItems: 25, 260022 Understand linear functions and linear equationsItems: 29, 30, 310023 Understand and apply concepts of measurementItems: 32, 34 |
| **Unit 8: Algebraic and Geometric Thinking**1. Understanding and responding to major issues that hinder algebraic thinking
2. Develop a conceptual understanding of linear functions, including the concepts of one-to-one correspondence, slope, direct variation, and y-intercept
3. Connect conceptual understanding of linear functions with graphic and symbolic representations (e.g., slope intercept form)
4. Understanding and responding to major issues that hinder geometric thinking
5. Integrating Griffin’s model, Mayer’s problem-solving model and components of number sense to understand the relationship between area and perimeter
 | 0022 Understand linear functions and linear equationsItems: 29, 30, 310017 Understand integers, fractions, decimals, percents, and mixed numbersItems: 7, 9, 10 |
| **Unit 9: Assessment and Intervention**1. Developing and applying an understanding of universal screening, progress monitoring, and diagnostic mathematical assessments
2. Understanding the use of selection criteria in determining appropriate research-based mathematical programs
3. Developing an understanding of the NC MTSS model as applied to mathematics and the alignment of activities from Foundations of Math to the Standards for Mathematical Practice
4. Developing an understanding of explicit, supplemental instruction and critical content areas
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**Reference guide to North Carolina Pearson: General Curriculum Mathematics Subtest**

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