Matching MATH *Connections*® with the Arkansas Mathematics Framework

This document quotes the Arkansas Mathematics Framework for grades 9-12. In boldface after each subpart are chapters of **MATH *Connections*** in which topics and skills relevant to that requirement receive significant attention in some sections. (*Note*: In many cases, ideas relevant to that requirement also appear in other chapters, not as an emphasized topic, but blended with other ideas in context.)

STRAND 1: NUMBER SENSE, PROPERTIES, AND OPERATIONS

CONTENT STANDARD 1 -- The student will communicate an understanding of the properties of numbers and operations (add, subtract, multiply, and divide).

GRADES 9-12

NPO.1.1. Represent numbers in a variety of equivalent forms.

Books 1: Chs. 1, 2, 5, 6, 7, 8; Books 2: Chs. 2, 3, 4; Books 3: Chs. 2, 4, 7

NPO.1.2. Make estimates appropriate to a given situation.

Books 1: Chs. 1, 2, 3, 4, 5, 6, 8; Books 2: Chs. 1, 2, 3, 4, 5; Books 3: Chs. 1, 2, 3, 4, 7

NPO.1.3. Verify results and determine the reasonableness of solutions.

Books 1: all chapters; Books 2: all chapters; Books 3: Chs. 1, 2, 3, 4, 5, 6, 7

NPO.1.4. Solve problems involving real numbers both with and without technology.

Books 1: all chapters; Books 2: all chapters; Books 3: Chs. 1, 2, 3, 4, 5, 7

NPO.1.5. Use the properties of the real number system to solve problems.

Books 1: Chs. 2, 5, 6; Books 2: Chs. 1, 4, 6; Books 3: Chs. 1, 2, 6, 7

NPO.1.6. Demonstrate understanding of relationships between the complex number system and its major subsystems.
Books 3: Chs. 1, 6, 7 and extension to Ch. 7

CONTENT STANDARD 2 -- The student will demonstrate and apply knowledge of numbers and numerical relationships to real-world situations.

9-12

NPO.2.1. Select and use appropriate problem solving methods and tools.

Throughout all chapters of all books

NPO 2.2. Demonstrate competency of roots by estimating square roots to the nearest tenth and using a calculator to compute decimal approximations of radicals.

Books 1: Chs. 4, 5; Books 2: Chs. 2, 4, 5; Books 3: Chs. 1, 2, 5, 7

NPO 2.3. Apply ratios and proportional reasoning in a variety of situations.

Books 1: Chs. 2, 3, 4, 5, 6, 8; Books 2: Chs. 1, 2, 3, 4, 5; Books 3: Chs. 2, 4, 7

STRAND 2: GEOMETRY AND SPATIAL SENSE

CONTENT STANDARD 1 -- The student will demonstrate, construct, communicate, and apply the properties of geometric shapes and spatial sense to connect geometry with problem solving situations.

9-12

GS.1.1. Describe, visualize, draw, construct and communicate ideas about geometric figures in one, two, and three dimensions. **Books 1: Chs. 3, 5; Books 2: all chapters; Books 3: Chs. 1, 2, 3, 5, 6, 7, 8**

GS.1.2. Investigate and predict results of combining, subdividing, and changing shapes of geometric figures in relation to perimeter, area and volume.

Books 2: Chs. 1, 2, 4, 5; Books 3: Chs. 5, 7,

GS.1.3. Find and analyze relationships among geometric figures using transformations in the coordinate systems.

Books 1: Ch. 3; Books 2: Chs. 4, 5, 6; Books 3: Chs. 1, 3, 4,

GS.1.4. Describe the intersection of two or more geometric figures geometrically and algebraically.

Books 1: Chs. 3, 5; Books 2: Chs. 2, 4, 5, 6; Books 3: Ch. 5

GS.1.5. Classify figures in terms of geometric relationships and informally apply these relationships.

Books 2: Chs. 1, 2, 3, 4, 5; Books 3: Ch. 8

GS.1.6. Apply geometric and trigonometric right triangle relationships.

Books 1: Ch. 3 ; Books 2: Chs. 1, 2, 3, 4, 5; Books 3: Chs. 3, 5, 7, 8

GS.1.7. Establish and explain relationships involving geometric concepts by using informal induction and deductive reasoning.

Books 1: Chs. 3, 5; Books 2: all chapters; Books 3: Chs. 1, 2, 3, 5, 6, 7, 8

GS.1.8. Use computer programs and graphing calculators to investigate geometric concepts and communicate the findings. **Books 1: Chs. 1, 3, 5; Books 2: Chs. 2, 3, 4, 5; Books 3: Chs. 1, 3, 7**

CONTENT STANDARD 2 -- The student will solve problems that connect geometric applications to other topics in mathematics and other fields.

9-12

GS.2.1. Solve real-world and mathematical problems using geometric models.

Books 1: Chs. 3, 5; Books 2: all chapters; Books 3: Chs. 1, 3, 4, 5, 7, 8

GS.2.2. Solve problems using coordinate geometry.

Books 1: Chs. 3, 4, 5, 6; Books 2: Chs. 1, 3, 4, 5, 6; Books 3: Chs. 1, 2, 3, 5, 7

STRAND 3: MEASUREMENT

CONTENT STANDARD 1 -- The student will use measurement attributes to describe and compare mathematical and real-world objects.

9-12

M.1.1. Describe the effect on perimeter, area, and volume when dimensions of a geometric object are changed.

Books 1: Ch. 6; Books 2: Chs. 1, 2, 4; Books 3: Chs. 4, 5,

M.1.2. Solve problems dealing with changes in length, width, height, radius, diameter, perimeter, area, and volume. **Books 1: Ch. 6 ; Books 2: Chs. 1, 2, 3, 4, 5; Books 3: Chs. 1, 3, 4, 5, 7**

CONTENT STANDARD 2 -- The student will demonstrate the appropriate use of measuring instruments.

9-12

M.2.1. Select and use measurement instruments found in the workplace.

Books 1: Chs. 3, 6; Books 2: Chs. 1, 2, 5

CONTENT STANDARD 3 -- The student will apply measurement concepts to solve problems inside and outside the field of mathematics.

9-12

M.3.1. Apply measurement formulas to solve problems.

Books 1: Ch. 6; Books 2: Chs. 1, 2, 3, 4, 5, ; Books 3: Chs. 1, 2, 3, 5, 7

M.3.2. Use appropriate techniques to measure quantities in order to achieve specified degrees of accuracy, precision, and error/tolerance.

Books 1: Chs. 4, 5; Books 2: Chs. 1, 2, 3, 4, 5; Books 3: Chs. 1, 2, 3, 7

M.3.3. Use technology to solve problems.

Books 1: all chapters; Books 2: Chs. 2, 3, 4, 6; Books 3: Chs. 1, 2, 3, 4, 5, 7; Appendices A, B, C

M.3.4. Apply the concepts of rate of change and indirect measurements.

Books 1: Chs. 3, 4, 5, 6; Books 2: Chs. 1, 2, 3, 5; Books 3: Chs. 1, 2, 3, 5, 7

M.3.5. Make and use scale drawings.

Books 1: Chs. 6; Books 2: Chs. 1, 2, 3, 5

STRAND 4: DATA ANALYSIS, STATISTICS AND PROBABILITY

CONTENT STANDARD 1 -- The student will perform the steps that comprise data analysis, from gathering information to communicating results.

9-12

DSP-1.1. Collect, organize, analyze and display data through the use of tables, charts and graphs.

Books 1: Chs. 1, 4, 5, 8; Books 3: Chs. 2, 3, 4

DSP.1.2. Read, interpret, and make predictions using tables and graphs with the aid of appropriate technology.

Books 1: Chs. 1, 4, 5, 8; Books 3: Chs. 2, 3, 4

DSP.1.3. Recognize and distinguish between valid or misleading use of statistics in our society.

Books 1: Chs. 1, 4; Books 3: Ch. 4

DSP.1.4. Describe measures of central tendency and dispersion in real-world situations.

Books 1: Chs. 1, 4; Books 3: Ch. 4

CONTENT STANDARD 2 -- The student will use probability models to perform experiments and simulations.

9-12

DSP.2.1. Design a probability experiment to study a problem and communicate the results.

Books 1: Ch. 8; Books 3: Ch. 4

DSP.2.2. Use counting techniques to determine the number of ways an event can occur.

Books 1: Chs. 5, 7, 8; Books 3: Chs. 4, 5, 6

DSP.2.3. Determine the probability of a simple event.

Books 1: Ch. 8; Books 3: Chs. 4, 6

DSP.2.4. Use technology to generate, organize, and display data.

Books 1: Chs. 1, 4, 5, 8; Books 3: Chs. 2, 3, 4

CONTENT STANDARD 3 -- The student will apply probability and statistical concepts in problem-solving and decision-making situations.

9-12

DSP.3.1. Choose a model that best fits a set of data.

Books 1: Chs. 1, 4, 5; Books 3: Chs. 2, 3, 4

DSP.3.2. Apply basic concepts of probability to real-world situations.

Books 1: Ch. 8; Books 3: Chs. 4, 6

DSP.3.3. Design statistical experiments to study a problem and communicate the results.

Books 1: Chs. 1, 4; Books 3: Chs. 4

DSP.4.4. Use technology to model data, determine probability and to aid in decision making.

Books 1: Chs. 4, 5, 8; Books 3: Chs. 2, 3, 4

STRAND 5: PATTERNS, ALGEBRA AND FUNCTIONS

CONTENT STANDARD 1 -- The student will use the language/symbols of algebra to represent patterns and functions.

9-12

PAF.1.1. Model and analyze real-world situations by using patterns and functions.

Books 1: all chapters; Books 2: all chapters; Books 3: Chs. 1, 2, 3, 4, 5, 6, 7

PAF.1.2. Use open sentences, equations, absolute value, algebra tiles, inequalities, absolute value inequalities, number lines, rectangular coordinate systems and matrices as representational tools.

Throughout all chapters of all books

PAF.1.3. Use appropriate notation and terminology to describe functions and their properties.

Books 1: Chs. 6, 8; Books 2: 1, 2, 3, 4, 6; Books 3: Chs. 1, 2, 3, 4, 5, 6, 7

CONTENT STANDARD 2 -- The student will use algebraic concepts to model, to solve, and to test solutions of mathematical and real-world problems.

9-12

PAF.2.1. Use equations, absolute value equations, inequalities, absolute value inequalities, and systems of equations and inequalities to solve mathematical and real-world problems.

Books 1: all chapters; Books 2: all chapters; Books 3: Chs. 1, 2, 3, 4, 5, 6, 7

PAF.2.2. Use mathematical reasoning to make conjectures and to justify conclusions.

Throughout all chapters of all books; formally in Books 3, Chs. 6, 7, 8

PAF.2.3. Solve equations with real and complex roots using a variety of algebraic and graphical methods and using appropriate tools.

Books 1: Chs. 3, 5, 6; Books 2: Chs. 1, 3, 6; Books 3: Chs. 1, 2, 3, 5, 7

PAF.2.4. Use approximation in problem solving and in assessing reasonableness of solutions.

Books 1: Chs. 1, 2, 3, 4, 5, 6; Books 2: Chs. 1, 2, 3, 4, 5; Books 3: Chs. 1, 2, 3, 4, 5, 7

PAF.2.5. Apply function concepts to model, graph, and deal with real-world situations.

Books 1: Chs. 2, 3, 5, 6, 8; Books 2: Chs. 1, 3, 4, 5, 6; Books 3: Chs. 1, 2, 3, 4, 5, 6, 7

PAF.2.6. Use technology to develop conceptual understanding and solve problems.

Books 1: all chapters; Books 2: Chs. 2, 3, 4, 5, 6; Books 3: Chs. 1, 2, 3, 4, 5, 7

PAF.2.7. Add, subtract, multiply, and divide polynomials and solve polynomial equations by factoring and graphing. **Books 1: Chs. 2, 3, 5, 6; Books 2: Ch. 1; Books 3: Chs. 1, 5**