A Correlation of

to the

Arkansas Mathematics Curriculum Framework

Grades K-5

C/M-94

Introduction

This document demonstrates how ***Investigations in Number, Data, and Space®*** supports the Arkansas Mathematics Curriculum Framework. The citations within this correlation provide Investigation Curriculum Unit titles, followed by the Investigation number and Session number or Focus Time/Choice Time title. Additional citations to Classroom Routines may be included.

Investigations in Number, Data, and Space®, a Kindergarten through Grade 5 program, offers a complete and flexible curriculum that aligns with the NCTM principles and Standards for School Mathematics. The main teaching tool is a single resource book, called the *teacher book,* for each unit in a grade level. Students explore the central topics in depth through a series of investigations, gradually encountering and using many important mathematical ideas. ***Investigations*** offer activity-based mathematics that encourage students to think creatively, develop their own strategies, and work together. Students practice skills through games, daily routines, activities, and practice pages.

The program blends concrete materials with appropriate technology. The software provided with several ***Investigations*** units harnesses the power of computers to help students explore mathematical ideas and relationships that cannot be explored in the same way with physical materials. A balanced approach to calculator use is found in the program.

Developed by TERC under a grant from the National Science Foundation, ***Investigations in Number, Data, and Space®*** is comprehensive in its approach to students of diverse learning styles, students from different cultures, and students of different language groups. In an effort to give mathematical lessons a broader spectrum, students are encouraged to explore working in groups, individually and as a whole class. By incorporating these methods into everyday learning, students learn to express mathematical thinking through talking, drawing, and writing.

Every unit in the Investigations curriculum offers a list of related children's literature that can be used to support the mathematical ideas presented in the unit. This list of books is found in the materials list located in the front of each unit.

Investigations in Number, Data and Space® was developed after three years of nationwide field-testing and includes teacher's practical suggestions, student dialogues, and teacher notes. Further information can be found on the internet at www.scottforesman.com/investigations.

Table of Contents

Investigations in Number, Data & Space
to the
Arkansas Mathematics Curriculum Framework

Kindergarten

Strand: Number and Operations

Standard 1 Number Sense:

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems

Arkansas Mathematics	Investigations in Number, Data, & Space
Whole Numbers	
NO.1.K.1 Count with understanding, explaining that each object should be counted only once and that placement of objects does not change the total amount	Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Investigation 2 Collecting, Counting and Measuring Investigation 1 – 2, 4 - 5 Counting Ourselves and Others Investigation 1 How Many in All? Investigation 1: Focus Time: Counting and Measuring
NO.1.K.2 Group physical objects to represent a whole number less than 10 in at least two ways using composition and decomposition Composition: A group of 5 cubes can be made by combining 2 red and 3 blue or 4 red and 1 blue Decomposition: 5 cubes can be separated into 2 red and 3 green or 1 red and 4 green	Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Investigation 2 Collecting, Counting, and Measuring Investigation 1 – 2, 4 – 6 How Many in All? Investigation 2, 4
NO.1.K.3 Connect various physical models and representations to the quantities they represent using number names, numerals and number words up to 10 with and without appropriate technology	Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Investigation 2 Collecting, Counting, and Measuring Investigation 1 – 2, 4 – 6 How Many in All? Investigation 2, 4

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.1.K.4 Represent numbers to 10 in various forms **Ex. 1 rod, 1 bundle of 10, tally marks, 10 units**	Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Investigation 2 Collecting, Counting, and Measuring Investigation 1 – 2, 4 – 6 How Many in All? Investigation 2, 4
NO.1.K.5 Recognize the number or quantity in sets up to 5 without counting, regardless of arrangement	Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Investigation 2 Collecting, Counting, and Measuring Investigation 1 – 2, 4 – 6 How Many in All? Investigation 2, 4
NO.1.K.6 Estimate quantities fewer than or equal to 10 and judge the reasonableness of the Estimate	Can be developed from: Grade 1 Building Number Sense Investigation 3: Session 9
NO.1.K.7 Orally determine relative position using ordinal numbers (first through tenth)	Mathematical Thinking in Kindergarten Investigation 3
NO.1.K.8 Compare 2 numbers, with less than 6 in each set, using objects and pictures, with and without appropriate technology **Ex.** **A: (XXX)** **B: (□ □)** **Set A has more elements than set B**	Collecting, Counting and Measuring Investigation 4 - 5
NO.1.K.9 Compare and order numbers less than twenty using terms more than, same amount as, less than	Collecting, Counting, and Measuring Investigation 3 - 6
Rational Numbers	
NO.1.K.10 Consecutively order sets of physical objects from 1 to 10	Collecting, Counting, and Measuring Investigation 3 – 6

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.1.K.11 Use physical models and drawings to represent commonly used fractions such as halves, thirds and fourths in relation to the whole	Can be developed from: Making Shapes and Building Blocks Investigation 4: Choice Time: Fill the Hexagons

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another

Arkansas Mathematics	Investigations in Number, Data, & Space
Number Theory	
NO.2.K.1 Count on (forward) and count back (backward) using physical models or a number line starting at any whole number between zero and twenty Ex. Start at six and count forward to ten. Start at eight and count backward to five.	Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Investigation 2 Collecting, Counting, and Measuring Investigation 1 – 2, 4 – 5 Counting Ourselves and Others Investigation 1 How Many in All? Investigation 1: Focus Time: Counting and Measuring
Whole Number Operations	
NO.2.K.2 Use physical and pictorial models to demonstrate various meanings of addition and subtraction See Appendix for examples.	How Many in All? Investigation 2 - 4
NO.2.K.3 Demonstrate the relationship between addition and subtraction with informal language and models in contextual situations involving whole numbers	How Many in All? Investigation 2 - 4

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.2.K.4 Partition or share a small set of objects into groups of equal size e.g., sharing 6 pencils equally among 3 children	Can be developed from: Making Shapes and Building Blocks Investigation 4: Choice Time: Fill the Hexagons

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates

Arkansas Mathematics	Investigations in Number, Data, & Space
Computational Fluency-Addition and Subtraction	
NO.3.K.1 Develop strategies for basic addition facts **• counting all** **• counting on** **• one more, two more**	Collecting, Counting, and Measuring Investigation 6 How Many in All? Investigation 2 - 4
NO.3.K.2 Develop strategies for basic subtraction facts **• counting back** **• one less, two less**	How Many in All? Investigation 2 - 4
Application of Computation	
NO.3.K.3 Solve problems by using a variety of methods and tools (e.g., objects, and/or illustrations, with and without appropriate technology and mental computations)	Mathematical Thinking in Kindergarten Investigation 4 Counting Ourselves and Others Investigation 4 How Many in All? Investigation 3

Strand: Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions

Arkansas Mathematics	Investigations in Number, Data, & Space
Sort and Classify	
A.4.K.1 Identify how objects are alike or different	Mathematical Thinking in Kindergarten Investigation 1: Choice Time Investigation 3: Choice Time: Exploring Interlocking Cubes Pattern Trains and Hopscotch Paths Investigation 1: Focus Time: What Do You Notice? Counting Ourselves and Others Investigation 2 - 3
A.4.K.2 Sort objects into groups in one or more ways and identify which attribute was used to sort	Mathematical Thinking in Kindergarten Investigation 1: Choice Time Investigation 3: Choice Time: Exploring Interlocking Cubes Pattern Trains and Hopscotch Paths Investigation 1: Focus Time: What Do You Notice? Counting Ourselves and Others Investigation 2 - 3
Recognize, Describe and Develop Patterns	
A.4.K.3 Identify patterns in the environment	Mathematical Thinking in Kindergarten Investigation 3: Focus Time: Calendar Pattern Trains and Hopscotch Paths Investigation 1 – 4

Arkansas Mathematics	Investigations in Number, Data, & Space
A.4.K.4 Use patterns to rote count up to 100 and count backward from 20 to 0	Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Investigation 2 Collecting, Counting, and Measuring Investigation 2, 4 Counting Ourselves and Others Investigation 1 How Many in All? Investigation 1: Focus Time: Counting and Measuring
A.4.K.5 Identify, describe and extend skip-counting patterns by 5s and 10s	Mathematical Thinking in Kindergarten Investigation 2 Collecting, Counting, and Measuring Investigation 2, 4
A.4.K.6 Duplicate, extend, create and describe repeating patterns using a wide variety of materials	Patterns, Trains and Hopscotch Paths Investigation 1 - 4

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols

Arkansas Mathematics	Investigations in Number, Data, & Space
Expressions, Equations and Inequalities	
A.5.K.1 Use drawings and labels to record solutions of addition and subtraction problems with answers less than or equal to 10	Collecting, Counting, and Measuring Investigation 6 How Many in All? Investigation 2 - 4

Arkansas Mathematics	Investigations in Number, Data, & Space
A.5.K.2 Identify, create, compare and describe sets of objects as more, less or equal	Collecting, Counting, and Measuring Investigation 3 - 6

Standard 7: Analysis of Change

Students shall analyze change in various contexts

Arkansas Mathematics	Investigations in Number, Data, & Space
Analyze Change	
A.7.K.1 Recognize qualitative change Ex. changes in seasons, temperature, height, etc "Today is colder/warmer than yesterday"	Collecting, Counting, and Measuring Investigation 3

Strand: Geometry

Standard 8: Geometric Properties

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships

Arkansas Mathematics	Investigations in Number, Data, & Space
Characteristics and Properties- Three Dimensional	
G.8.K.1 Sort and describe 3-D solids (sphere, cube, cone, and cylinder) by investigating their physical characteristics	Making Shapes and Building Blocks Investigation 3 - 4
G.8.K.2 Locate the presence of two-dimensional figures within three-dimensional objects in the environment	Making Shapes and Building Blocks Investigation 5

Arkansas Mathematics	Investigations in Number, Data, & Space
Characteristics and Properties- Two Dimensional	
G.8.K.3 Sort, describe and make geometric figures (triangle, rectangle [including square] and circle) by investigating their physical characteristics independent of position or size	Making Shapes and Building Blocks Investigation 1 – 2, 5

Standard 9: Transformation of Shapes

Students shall apply transformations and the use of symmetry to analyze mathematical situations

Arkansas Mathematics	Investigations in Number, Data, & Space
Symmetry and Transformations	
G.9.K.1 Identify figures with a line of symmetry as they appear in the environment **Ex. Butterfly, leaf**	Making Shapes and Building Blocks Investigation 1 - 5
G.9.K.2 Explore slides, flips and turns	Making Shapes and Building Blocks Investigation 1 - 5

Standard 10: Coordinate Geometry

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems

Arkansas Mathematics	Investigations in Number, Data, & Space
Coordinate Geometry	
G.10.K.1 Demonstrate and describe the relative position of objects as follows: over, under, inside, outside, on, beside, between, above, below, on top of, upside-down, behind, in back of and in front of	Pattern Trains and Hopscotch Paths Investigation 4: Choice Time: Staircase Patterns Making Shapes and Building Blocks Investigation 2 – 3, 5

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling

Arkansas Mathematics	Investigations in Number, Data, & Space
Spatial Visualization and Models	
G.11.K.1 Arrange physical materials (toothpicks, pretzel sticks, modeling clay, etc…) to form two-dimensional figures	Making Shapes and Building Blocks Investigation 1 - 2

Strand: Measurement

Standard 12: Physical Attributes

Students shall use attributes of measurement to describe and compare mathematical and real-world objects

Arkansas Mathematics	Investigations in Number, Data, & Space
Time: Calendar	
M.12.K.1 Recognize that a calendar is used to measure time and use it to identify units of time (day, week, month, season, year) and compare them	Mathematical Thinking in Kindergarten Investigation 3: Focus Time: Calendar
M.12.K.2 Orally sequence and count the days of the week	Mathematical Thinking in Kindergarten Investigation 3: Focus Time: Calendar
Time: Clock	
M.12.K.3 Recognize that a clock is used to tell time	Grade1- In an appendix at the end of each text is Classroom Routines – Time and Change, consisting of activities in which students explore units of time, relationships among them, daily schedules and weather.
Money	
M.12.K.4 Recognize and identify attributes of penny, nickel, dime, and quarter	Can be developed from: Counting Ourselves and Others Investigation 3: Choice Time: The Grocery Store
M.12.K.5 State the values of coins (penny, nickel, dime)	Can be developed from: Counting Ourselves and Others Investigation 3: Choice Time: The Grocery Store
Temperature	
M.12.K.6 Differentiate and make connections between hot and cold temperatures **Ex. What else is as cold as ice cream? If it is cold outside, what type of clothing will you wear?**	Can be developed from: Mathematical Thinking in Kindergarten Investigation 3

Arkansas Mathematics	Investigations in Number, Data, & Space
Tools and Attributes	
M.12.K.7 Explore the attributes of length, weight, capacity, and mass using relative terms (longer, shorter, bigger, smaller, heavier, lighter, more and less) **Ex. How many cheerios/marbles will a container hold? Which is longer, a pencil or paper clip?**	Collecting, Counting, and Measuring Investigation 3 How Many in All? Investigation 1

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement

Arkansas Mathematics	Investigations in Number, Data, & Space
Calendar	
M.13.K.1 Recognize that a calendar is used to measure time and use it to identify units of time (day, week, month, season, year) and compare them	Mathematical Thinking in Kindergarten Investigation 3: Focus Time: Calendar
Clock	
M.13.K.2 Tell time to the hour the nearest hour using analog and digital clock	Grade1- In an appendix at the end of each text is Classroom Routines – Time and Change, consisting of activities in which students explore units of time, relationships among them, daily schedules and weather.

Arkansas Mathematics	Investigations in Number, Data, & Space
Elapsed Time	
M.13.K.3 Order events based on time Ex. • **Activities that take long or short time** • **Review what we do first, next, last** • **Recall what we did or plan to do yesterday, today, and tomorrow**	Can be developed from: Mathematical Thinking in Kindergarten Investigation 3: Focus Time: Calendar
Applications	
M.13.K.4 Name common tools for measurement (balance scale, ruler and thermometer)	Collecting, Counting, and Measuring Investigation 3 How Many in All? Investigation 1
M.13.K.5 Estimate and measure length, capacity/volume and mass of familiar objects using non-standard units	Collecting, Counting, and Measuring Investigation 3 How Many in All? Investigation 1
Perimeter	
M.13.K.6 Surround a figure with objects (links, craft sticks, etc) and tell how many it takes to go around (Perimeter answers the question: How many units does it take to travel a path?)	Can be developed from: How Many in All? Investigation 1
Area	
M.13.K.7 Cover a figure with one type of shape and tell how many it takes to cover (Area answers the questions: How much to cover?)	Can be developed from: Making Shapes and Building Blocks Investigation 4: Choice Time: Fill in the Hexagons

Strand: Data Analysis and Probability

Standard 14: Data Representation

Students shall formulate questions that can be addressed with data and collect, organize and display relevant data to answer them

Arkansas Mathematics	Investigations in Number, Data, & Space
Collect, Organize and Display Data	
DAP.14.K.1 Explore and discuss data collection by collecting, organizing and displaying physical objects	Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Counting Ourselves and Others Investigation 1 – 4

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data

Arkansas Mathematics	Investigations in Number, Data, & Space
Data Analysis	
DAP.15.K.1 Analyze and interpret concrete and pictorial graphs (i.e. bar graphs, pictographs, Venn diagrams, T-chart)	Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Counting Ourselves and Others Investigation 1 – 4

Standard 17: Probability

Students shall understand and apply basic concepts of probability

Arkansas Mathematics	Investigations in Number, Data, & Space
Probability	
DAP.17.K.1 Describe the probability of an event as being possible or not possible **Ex. There are only apples in this bag. Could I pull a banana from this bag?**	Grade 1 Survey Questions and Secret Rules Investigation 4: Sessions 4 - 5

Scott Foresman Addison – Wesley Mathematics
to the
Arkansas Mathematics Curriculum Framework

Grade One

Strand: Number and Operations

Standard 1 Number Sense:

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems

Arkansas Mathematics	Investigations in Number, Data, & Space
Whole Numbers	
NO.1.1.1 Use efficient strategies to count a given set of objects in groups of 10 up to 100	Number Games and Story Problems Investigation 2: Sessions 1 – 2, 9 – 13
NO.1.1.2 Represent a whole number less than 15 in all possible ways using composition and decomposition **Composition: 10 can be made by combining 1 and 9, 2 and 8, 3 and 7, 4 and 6, 5 and 5** **Decomposition: 10 can be separated into 1 and 9, 2 and 8, 3 and 7, 4 and 6, and 5 and 5**	Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 6 Investigation 4: Sessions 1 – 6 Building Number Sense Investigation 1: Sessions 1 – 9 Investigation 2: Sessions 1 – 9 Number Games and Story Problems Investigation 1: Sessions 1 – 10 Investigation 2: Sessions 1 – 8 Investigation 3: Sessions 1 – 13
NO.1.1.3 Connect various physical models and representations to the quantities they represent using number names, numerals and number words to 20 with and without appropriate technology	Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 6 Investigation 4: Sessions 1 – 6 Building Number Sense Investigation 1: Sessions 1 – 9 Investigation 2: Sessions 1 – 9 Investigation 3: Sessions 1 – 2, 5 – 7 Number Games and Story Problems Investigation 1: Sessions 1 – 10 Investigation 2: Sessions 1 – 13

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.1.1.4 Represent numbers to 20 in various forms **Ex.** **2 rods, 2 bundles of 10, tally marks, a rod and 10 units**	Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 6 Investigation 4: Sessions 1 – 6 Building Number Sense Investigation 1: Sessions 1 – 9 Investigation 2: Sessions 1 – 9 Investigation 3: Sessions 1 – 2, 5 – 7 Number Games and Story Problems Investigation 1: Sessions 1 – 10 Investigation 2: Sessions 1 – 13
NO.1.1.5 Use multiple models to develop understandings of place value including tens and ones **Ex.** **pictures of base 10 blocks to show 23 will be ___tens and ___ones = ___** ☐ **ones** ▭ **tens**	Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 6 Investigation 4: Sessions 1 – 4 Building Number Sense Investigation 2: Sessions 1 – 9 Investigation 2: Sessions 1 – 2 Number Games and Story Problems Investigation 2: Sessions 6 - 8
NO.1.1.6 Recognize the number or quantity of sets up to 10 without counting, regardless of arrangement	Mathematical Thinking at Grade 1 Investigation 2: Session 1
NO.1.1.7 Estimate the results of whole number addition and subtraction problems and judge the reasonableness	Building Number Sense Investigation 3: Session 9 Investigation 4: Sessions 1 – 10 Number Games and Story Problems Investigation 3: Sessions 1 – 13
NO.1.1.8 Determine relative position using ordinal numbers (first through twelfth)	Building Number Sense Investigation 3: Sessions 1 – 2, 9 Number Games and Story Problems Investigation 2: Sessions 6 – 8

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.1.1.9 Compare 2 numbers, with less than 12 in each set, using objects and pictures with and without appropriate technology **Ex.** **A: (XXXXXX)** **B: (□ □ □)**	Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 3, 5 – 6 Investigation 4: Sessions 2 – 3 Building Number Sense Investigation 2: Session 3 Investigation 3: Sessions 3 - 7
NO.1.1.10 Compare 2 numbers, less than 100 using mathematical language of greater than, equal to (same amount as), less than	Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 3, 5 – 6 Investigation 4: Sessions 2 – 3 Building Number Sense Investigation 2: Session 3 Investigation 3: Sessions 3 - 7
Rational Numbers	
NO.1.1.11 Communicate the relative position of any number less than 20 (18 is less than 20 and greater than 12)	Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 3, 5 – 6 Investigation 4: Sessions 2 – 3 Building Number Sense Investigation 2: Session 3 Investigation 3: Sessions 3 - 7
NO.1.1.12 Represent commonly used fractions using words and physical models for halves, thirds and fourths **Ex.** • **recognize that fractions are represented by equal parts of a whole** • **identify and illustrate parts of sets of objects**	Grade 2 Shapes, Halves, and Symmetry Investigation 3: Sessions 1 - 8

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another

Arkansas Mathematics	Investigations in Number, Data, & Space
Number Theory	
NO.2.1.1 Count on (forward) and back (backward) using physical models or a number line starting at any whole number up to fifty	Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 3 Investigation 4: Sessions 1 – 6 Building Number Sense Investigation 1: Sessions 1 – 9 Investigation 2: Sessions 1 – 9 Investigation 3: Sessions 1 – 2, 5 – 7 Number Games and Story Problems Investigation 1: Sessions 1 – 6 Investigation 2: Sessions 1 – 13
NO.2.1.2 Develop an understanding of the commutative (turn around facts) and identity (+0) properties of addition using objects	Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 6 Investigation 4: Session 2 – 4, 6 Building Number Sense Investigation 2: Sessions 1 – 9 Investigation 4: Sessions 1 – 6 Number Games and Story Problems Investigation 1: Sessions 1 – 10 Investigation 2: Session 1 Investigation 3: Session 1

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.2.1.3 Apply number theory • **determine if a 1- digit number is odd or even** • **use the terms sum and difference in appropriate context** • **use conventional symbols (+, -,=) to represent the operations of addition and subtraction**	• Can be developed from: Number Games and Story Problems Investigation 2: Session 2 • Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 6 Investigation 4: Sessions 2 – 4, 6 Building Number Sense Investigation 2: Sessions 1 – 9 Investigation 4: Sessions 1 – 10 Number Games and Story Problems Investigation 1: Sessions 1 – 10 Investigation 3: Sessions 1 – 13 • Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 6 Investigation 4: Sessions 2 – 4, 6 Building Number Sense Investigation 2: Sessions 1 – 9 Investigation 4: Sessions 1 – 10 Number Games and Story Problems Investigation 1: Sessions 1 – 10 Investigation 3: Sessions 1 – 13
Whole Number Operations	
NO.2.1.4 Use physical, pictorial and symbolic models to demonstrate various meanings of addition and subtraction **See Appendix for examples.**	Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 6 Investigation 4: Sessions 2 – 4, 6 Building Number Sense Investigation 2: Sessions 1 – 9 Investigation 4: Sessions 1 – 10 Number Games and Story Problems Investigation 1: Sessions 1 – 10 Investigation 3: Sessions 1 - 13

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.2.1.5 Identify and use relationships between addition and subtraction to solve problems in contextual situations involving whole numbers	Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 6 Investigation 4: Sessions 2 – 4, 6 Building Number Sense Investigation 2: Sessions 1 – 9 Investigation 4: Sessions 1 – 10 Number Games and Story Problems Investigation 1: Sessions 1 – 10 Investigation 3: Sessions 1 - 13
NO.2.1.6 Model and represent division as sharing equally in contextual situations Ex Sharing cookies equally among four children	Grade 2 Shapes, Halves, and Symmetry Investigation 3: Sessions 1 - 8

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates

Arkansas Mathematics	Investigations in Number, Data, & Space
Computational Fluency-Addition and Subtraction	
NO.3.1.1 Develop strategies for basic addition facts **• counting all** **• counting on** **• one more, two more** **• doubles** **• doubles plus one or minus one** **• make ten** **• using ten frames** **• Identity Property (adding zero)**	Mathematical Thinking at Grade 1 Investigation 2: Sessions 1 – 6 Investigation 4: Sessions 2 – 4, 6 Building Number Sense Investigation 2: Sessions 1 – 9 Investigation 4: Sessions 1 – 10 Number Games and Story Problems Investigation 1: Sessions 1 – 10 Investigation 3: Sessions 1 - 13

NO.3.1.2 Develop strategies for basic subtraction facts • **relating to addition (Ex. Think of 7 – 3 =____as "3 +___=7")** • **one less, two less** • **all but one (Ex 9 – 8, 6 – 5)** • **using ten frames of the answers**	Building Number Sense Investigation 4: Sessions 7 – 10 Number Games and Story Problems Investigation 3: Sessions 2 – 8, 10 - 13
Application of Computation	
NO.3.1.3 Solve problems by using a variety of methods and tools (e.g., objects, mental computations, paper and pencil and with and without appropriate technology)	Mathematical Thinking at Grade 1 Investigation 5: Sessions 2 – 6 Building Number Sense Investigation 4: Sessions 3 – 5, 10 Number Games and Story Problems Investigation 1: Session 10 Investigation 3: Sessions 3 – 13

Strand: Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions

Arkansas Mathematics	Investigations in Number, Data, & Space
Sort and Classify	
A.4.1.1 Sort and classify objects by one or two attributes in more than one way	Survey Questions and Secret Rules Investigation 1: Sessions 1 – 9

Arkansas Mathematics	Investigations in Number, Data, & Space
Recognize, Describe and Develop Patterns	
A.4.1.2 Identify and describe patterns in the environment	Mathematical Thinking at Grade 1 Investigation 3: Sessions 1 – 6 Building Number Sense Investigation 3: Session 8 Quilt Squares and Block Towers Investigation 1: Sessions 13 - 15
A.4.1.3 Use patterns to count forward and backward when given a number less than or equal to 50	Building Number Sense Investigation 3: Sessions 1 – 2 Number Games and Story Problems Investigation 2: Sessions 1 – 2, 6 – 13
A.4.1.4 Identify, describe and extend skip-counting patterns by 2s	Building Number Sense Investigation 3: Sessions 1 – 2 Number Games and Story Problems Investigation 2: Sessions 1 – 2, 6 – 13
A.4.1.5 Identify a number that is one more or one less than any whole number less than 100	Building Number Sense Investigation 3: Sessions 1 – 2 Number Games and Story Problems Investigation 2: Sessions 6 – 8
A.4.1.6 Recognize, extend, and create simple repeating and growing patterns using a wide variety of materials and describe them using words, pictures or symbols	Mathematical Thinking at Grade 1 Investigation 3: Sessions 1 – 6 Building Number Sense Investigation 3: Session 8 Investigation 4: Session 10 Number Games and Story Problems Investigation 2: Sessions 1 – 2, 6 – 13

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols

Arkansas Mathematics	Investigations in Number, Data, & Space
Expressions, Equations and Inequalities	
A.5.1.1 Select and/or write number sentences to find the unknown in problem- solving contexts involving single-digit addition and subtraction using appropriate labels **Ex.** **Bob had 5 baseball cards. His friend gave him some more. Now he has seven cards. How many cards did his friend give him?**	Building Number Sense Investigation 4: Sessions 3 – 5, 10 Number Games and Story Problems Investigation 1: Session 10 Investigation 3: Sessions 3 - 13
A.5.1.2 Recognize that "=" indicates a relationship in which the quantities on each side of an equation are equal **Ex.** **3 + 2 = 4 + 1**	Mathematical Thinking at Grade 1 Investigation 2: Sessions 4 – 6 Investigation 4: Sessions 4, 6 Building Number Sense Investigation 2: Sessions 1 – 9 Number Games and Story Problems Investigation 1: Sessions 1 – 10
A.5.1.3 Recognize that symbols such as □, Δ and ◊ in an addition or subtraction equation, represent a missing value that will make the statement true **Ex.** **□ + 3 = 6** **5 + 7 = Δ** **4 = 5 – ◊**	Mathematical Thinking at Grade 1 Investigation 2: Sessions 4 – 6 Investigation 4: Sessions 2 – 4 Building Number Sense Investigation 2: Sessions 1 – 2, 4 – 9 Number Games and Story Problems Investigation 3: Session 9

Standard 6: Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships

Arkansas Mathematics	Investigations in Number, Data, & Space
Algebraic Models and Relationships	
A.6.1.1 Explore the use of a chart or table to organize information and to understand relationships **People** | **Eyes** **1** | **2** **2** | **4** **3** | **6** **4** | **8** **5** | □	Grade 2 In an appendix at the end of each text is Classroom Routines – How Many Pockets. In this activity students develop tables and charts to organize information and to understand relationships.

Standard 7: Analysis of Change

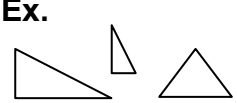
Students shall analyze change in various contexts

Arkansas Mathematics	Investigations in Number, Data, & Space
Analyze Change	
A.7.1.1 Interpret qualitative change Ex. **changes in seasons, temperature, height, etc "Today is colder than yesterday, so I need to wear a jacket"**	In an appendix at the end of each text is Classroom Routines – Time and Change, consisting of activities in which students explore units of time, relationships among them, daily schedules and weather.

Strand: Geometry

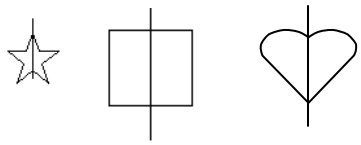
Standard 8: Geometric Properties

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships

Arkansas Mathematics	Investigations in Number, Data, & Space
Characteristics and Properties- Three Dimensional	
G.8.1.1 Compare 3-D solids (sphere, cube, rectangular prism, cone, and cylinder) by investigating their physical characteristics	Mathematical Thinking at Grade 1 Investigation 1: Session 1 Quilt Squares and Block Towns Investigation 2: Sessions 1 – 10 Investigation 3: Sessions 1 – 5
G.8.1.2 Investigate the presence of three-dimensional objects in the environment	Quilt Squares and Block Towns Investigation 2: Sessions 1 – 10 Investigation 3: Sessions 1 – 5
Characteristics and Properties- Two Dimensional	
G.8.1.3 Compare and make geometric figures (triangle, rectangle [including square] and circle) by investigating their physical characteristics independent of position or size **Ex.** 	Mathematical Thinking at Grade 1 Investigation 1: Session 1 Survey Questions and Secret Rules Investigation 1: Sessions 1 – 2 Quilt Squares and Block Towns Investigation 1: Sessions 1 - 15

Standard 9: Transformation of Shapes

Students shall apply transformations and the use of symmetry to analyze mathematical situations

Arkansas Mathematics	Investigations in Number, Data, & Space
Symmetry and Transformations	
G.9.1.1 Identify a line or lines of symmetry in two –dimensional figures and justify by folding **Ex.** 	Mathematical Thinking at Grade 1 Investigation 1: Session 1 Quilt Squares and Block Towns Investigation 1: Sessions 1, 13 – 15
G.9.1.2 Manipulate two-dimensional figures through slides, flips and turns	Mathematical Thinking at Grade 1 Investigation 1: Session 1 Quilt Squares and Block Towns Investigation 1: Sessions 3 - 10

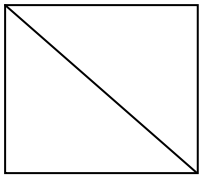
Standard 10: Coordinate Geometry

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems

Arkansas Mathematics	Investigations in Number, Data, & Space
Coordinate Geometry	
G.10.1.1 Extend the use of location words to include distance (near, far, close to) and direction (left and right)	Quilt Squares and Block Towns Investigation 3: Sessions 6 - 7

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling

Arkansas Mathematics	Investigations in Number, Data, & Space
Spatial Visualization and Models	
G.11.1.1 Replicate a simple two-dimensional figure from a briefly displayed example or from a description	Mathematical Thinking at Grade 1 Investigation 1: Session 1 Quilt Squares and Block Towns Investigation 1: Sessions 1 – 15
G.11.1.2 Recognize that new figures can be created by combining and subdividing models of existing figures **Ex.** 	Mathematical Thinking at Grade 1 Investigation 1: Sessions 1 - 4 Quilt Squares and Block Towns Investigation 1: Sessions 1 – 15

Strand: Measurement

Standard 12: Physical Attributes

Students shall use attributes of measurement to describe and compare mathematical and real-world objects

Arkansas Mathematics	Investigations in Number, Data, & Space
Time: Calendar	
M.12.1.1 Recognize the number of days in a week and the number of days in a month using a calendar	Survey Questions and Secret Rules Investigation 3: Sessions 1 - 3
M.12.1.2 Orally sequence the months of the year	Survey Questions and Secret Rules Investigation 3: Sessions 1 - 3

Arkansas Mathematics	Investigations in Number, Data, & Space
Time: Clock	
M.12.1.3 Recognize that an hour is longer than a minute and a minute is longer than a second	In an appendix at the end of each text is Classroom Routines – Time and Change, consisting of activities in which students explore units of time, relationships among them, daily schedules and weather.
Money	
M.12.1.4 Recognize and identify attributes of penny, nickel, dime, quarter and dollar bill	Number Games and Story Problems Investigation 2: Session 3
M.12.1.5 State the values of a penny, nickel, dime, and quarter and dollar bill	Number Games and Story Problems Investigation 2: Session 3
M.12.1.6 Compare the value of coins (pennies, nickels, dimes and quarters)	Number Games and Story Problems Investigation 2: Session 3
Temperature	
M.12.1.7 Distinguish between hot and cold temperatures on a thermometer Ex. The higher the mercury level the warmer the temperature	In an appendix at the end of each text is Classroom Routines – Time and Change, consisting of activities in which students explore units of time, relationships among them, daily schedules and weather.
Tools and Attributes	
M.12.1.8 Recognize attributes of measurement (length, weight, capacity and mass) and identify appropriate tools used to measure each attribute	Bigger, Taller, Heavier, Smaller Investigation 1: Sessions 1 – 6 Investigation 2: Sessions 1 – 7 Investigation 3: Sessions 1 – 5

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement

Arkansas Mathematics	Investigations in Number, Data, & Space
Calendar	
M.13.1.1 Use a calendar to determine elapsed time involving a time period of one week	Survey Questions and Secret Rules Investigation 3: Sessions 1 - 3
Clock	
M.13.1.2 Tell time to the half-hour	In an appendix at the end of each text is Classroom Routines – Time and Change, consisting of activities in which students explore units of time, relationships among them, daily schedules and weather
Elapsed Time	
M.13.1.3 Determine elapsed time (to the hour) in contextual situations **<u>End time unknown</u>** **Ex.** **Lunch began at 11:00 and lasted 1 hour. When was lunch over?** **<u>Elapsed hours unknown</u>** **Ex.** **John went to Tim's house at 3:00. He left at 5:00. How long did he stay?** **<u>Beginning time unknown</u>** **Ex.** **Mary watched a movie for 2 hours. The movie ended at 8:00. When did the movie begin?**	In an appendix at the end of each text is Classroom Routines – Time and Change, consisting of activities in which students explore units of time, relationships among them, daily schedules and weather.
Money	
M.13.1.4 **Determine the value of a small collection of coins (with a total value up to one dollar) using 1 or 2 different types of coins, including pennies, nickels, dimes and quarters**	Number Games and Story Problems Investigation 2: Session 3

Arkansas Mathematics	Investigations in Number, Data, & Space
M.13.1.5 **Represent and write the value of money using the cent sign**	Number Games and Story Problems Investigation 2: Session 3
M.13.1.6 **Show different combination of coins that have the same value**	Number Games and Story Problems Investigation 2: Session 3
Applications	
M.13.1.7 Select the appropriate non-standard measurement tools for length, capacity and mass	Bigger, Taller, Heavier, Smaller Investigation 1: Sessions 1 – 6 Investigation 2: Sessions 1 – 7 Investigation 3: Sessions 1 – 5
M.13.1.8 Estimate and measure length, capacity/volume and mass with non-standard units	Bigger, Taller, Heavier, Smaller Investigation 1: Sessions 1 – 6 Investigation 2: Sessions 1 – 7 Investigation 3: Sessions 1 – 5
Perimeter	
M.13.1.9 Surround a figure with objects and tell how many it takes to go around	Can be developed from: Bigger, Taller, Heavier, Smaller Investigation 3: Sessions 1 – 5
Area	
M.13.1.10 Cover a figure with squares and tell how many it takes	Can be developed from: Quilt Squares and Block Towns Investigation 2: Sessions 8 – 10

Strand: Data Analysis and Probability

Standard 14: Data Representation

Students shall formulate questions that can be addressed with data and collect, organize and display relevant data to answer them

Arkansas Mathematics	Investigations in Number, Data, & Space
Collect, Organize and Display data	
DAP.14.1.1 Identify the purpose for data collection and collect, organize and display physical objects for describing the results	Mathematical Thinking at Grade 1 Investigation 5: Sessions 1 – 6 Survey Questions and Secret Rules Investigation 2: Sessions 1 – 6 Investigation 3: Sessions 1- 3 Investigation 4: Sessions 1 – 5

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data

Arkansas Mathematics	Investigations in Number, Data, & Space
Data Analysis	
DAP.15.1.1 Analyze and interpret concrete and pictorial graphs (i.e. bar graphs, pictographs, Venn diagrams, T-chart)	Mathematical Thinking at Grade 1 Investigation 5: Sessions 3 – 6 Survey Questions and Secret Rules Investigation 2: Sessions 5 – 6 Investigation 3: Sessions 1 – 3 Investigation 4: Sessions 1 – 5
DAP.15.1.2 Make a true statement about the data displayed on a graph or chart (i.e. 5 people ride the bus)	Mathematical Thinking at Grade 1 Investigation 5: Sessions 1 – 6 Survey Questions and Secret Rules Investigation 2: Sessions 5 – 6 Investigation 3: Sessions 1 – 3 Investigation 4: Sessions 1 – 5

Standard 16: Inferences and Predictions

Students shall develop and evaluate inferences and predictions that are based on data

Arkansas Mathematics	Investigations in Number, Data, & Space
Inferences and Predictions	
DAP.16.1.1 Explore making simple predictions for a given set of data	Mathematical Thinking at Grade 1 Investigation 5: Sessions 1 – 6 Survey Questions and Secret Rules Investigation 2: Sessions 1 – 6 Investigation 3: Sessions 1 – 3 Investigation 4: Sessions 1 – 5

Standard 17: Probability

Students shall understand and apply basic concepts of probability

Arkansas Mathematics	Investigations in Number, Data, & Space
Probability	
DAP.17.1.1 Describe the probability of an event as being more, less, or equally likely to occur **Ex. There are 10 red cubes and 4 blue cubes in this bag. Which color are you more/less likely to pull from this bag?**	Can be developed from: Survey Questions and Secret Rules Investigation 4: Sessions 4 - 5

Investigations in Number, Data, & Space
to the
Arkansas Mathematics Curriculum Framework

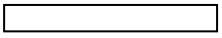
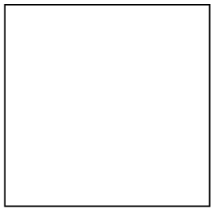
Grade Two

Strand: Number and Operations

Standard 1 Number Sense:

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems

Arkansas Mathematics	Investigations in Number, Data, & Space
Whole Numbers	
NO.1.2.1 Use efficient strategies to count a given set of objects in groups of 2s and 5s to 100 and in groups of 3s to 30	Mathematical Thinking at Grade 2 Investigation 4: Session 1 Coins, Coupons, and Combinations Investigation 2: Sessions 1 – 5, 10 Putting Together and Taking Apart Investigation 2: Sessions 1 – 2
NO.1.2.2 Represent a whole number in multiple ways using composition and decomposition **Ex** **A collection of 80 blocks** **Composition: 80 can be made by combining: 70 and 10, 60 and 20** **Decomposition: 80 can be separated into 50 and 30, 40 and 40**	Mathematical Thinking at Grade 2 Investigation 1: Session 1 Investigation 2: Sessions 1 – 3, 6, 8 Coins, Coupons, and Combinations Investigation 1: Sessions 1 – 6, 10 Investigation 2: Sessions 3, 6 – 9 Investigation 4: Sessions 1 – 4 Putting Together and Taking Apart Investigation 2: Sessions 1 – 7 Investigation 4: Sessions 1 - 4
NO.1.2.3 Connect various physical models and representations to the quantities they represent using number names, numerals and number words to 100 with and without appropriate technology	Mathematical Thinking at Grade 2 Investigation 1: Session 1 Investigation 2: Sessions 1 – 3, 6, 8 Coins, Coupons, and Combinations Investigation 1: Sessions 1 – 6, 10 Investigation 2: Sessions 3, 6 – 9 Investigation 4: Sessions 1 – 4 Putting Together and Taking Apart Investigation 2: Sessions 1 – 7 Investigation 4: Sessions 1 - 4

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.1.2.4 Represent numbers to 100 in various forms **Ex.** **Arrange tally marks, combinations of rods and units**	Mathematical Thinking at Grade 2 Investigation 1: Session 1 Investigation 2: Sessions 1 – 3, 6, 8 Coins, Coupons, and Combinations Investigation 1: Sessions 1 – 6, 10 Investigation 2: Sessions 3, 6 – 9 Investigation 4: Sessions 1 – 4 Putting Together and Taking Apart Investigation 2: Sessions 1 – 7 Investigation 4: Sessions 1 - 4
NO.1.2.5 Use multiple models to represent understanding of place value including hundreds **Ex. 127 is 1 flat and 2 ten rods and 7 units (find pictures) ___hundreds _____tens _____ones added is 100 + 20 + 7** ☐ **ones**  **tens**  **hundreds**	Mathematical Thinking at Grade 2 Investigation 2: Sessions 6, 8 Investigation 4: Sessions 1 – 5 Coins, Coupons, and Combinations Investigation 1: Sessions 1 – 3 Investigation 2: Sessions 1 – 10 Investigation 4: Sessions 1 – 4 Putting Together and Taking Apart Investigation 2: Sessions 1 – 7 Investigation 4: Sessions 1 – 4 Investigation 5: Sessions 2 – 3, 6
NO.1.2.6 Determine relative position using ordinal numbers (first through eighteenth)	Mathematical Thinking at Grade 2 Investigation 4: Sessions 1 – 4 Coins, Coupons, and Combinations Investigation 2: Session 10 Investigation 4: Sessions 1 – 4 Putting Together and Taking Apart Investigation 2: Session 1 Timelines and Rhythm Patterns Investigation 1: Sessions 1 – 3

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.1.2.7 Compare 2 numbers, less than 100 using numerals and =, <, > with and without appropriate technology	Mathematical Thinking at Grade 2 Investigation 1: Session 1 Investigation 2: Sessions 2 – 3 Investigation 5: Session 3 Coins, Coupons, and Combinations Investigation 2: Session 10 Investigation 4: Sessions 1 – 4 Putting Together and Taking Apart Investigation 2: Sessions 1 – 7 Investigation 4: Sessions 1 – 4 Investigation 5: Sessions 1 – 2
Rational Numbers	
NO.1.2.8 Communicate the relative position of any number less than 100 (27 is greater than 25 and less than 30)	Mathematical Thinking at Grade 2 Investigation 1: Session 1 Investigation 2: Sessions 2 – 3 Investigation 5: Session 3 Coins, Coupons, and Combinations Investigation 2: Session 10 Investigation 4: Sessions 1 – 4 Putting Together and Taking Apart Investigation 2: Sessions 1 – 7 Investigation 4: Sessions 1 – 4 Investigation 5: Sessions 1 –2
NO.1.2.9 Represent fractions (halves, thirds, fourths, sixths and eighths) using words, numerals, and physical models **Ex.** **Identify and illustrate parts of a whole**	Shapes, Halves, and Symmetry Investigation 3: Sessions 1- 8
NO.1.2.10 Utilize models to recognize that a fractional part can mean different amounts depending on the original quantity	Shapes, Halves, and Symmetry Investigation 3: Sessions 1- 8

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another

Arkansas Mathematics	Investigations in Number, Data, & Space
Number Theory	
NO.2.2.1 Count on (forward) and back (backward) on a number line and a 100's chart starting at any whole number up to 100	Mathematical Thinking at Grade 2 Investigation 2: Sessions 4 – 5 Investigation 4: Session 1- 4 Coins, Coupons, and Combinations Investigation 2: Sessions 1 – 10 Investigation 4: Sessions 1 – 4 Putting Together and Taking Apart Investigation 2: Sessions 1 – 7
NO.2.2.2 Model and use the commutative property for addition Ex. 3 + 2 is the same as (=) 2 + 3	Mathematical Thinking at Grade 2 Investigation 1: Sessions 1 – 3 Putting Together and Taking Apart Investigation 4: Sessions 1 – 4
NO.2.2.3 Develop an understanding of the associative property of addition using objects	Mathematical Thinking at Grade 2 Investigation 2: Sessions 2 – 3, 8 Coins, Coupons, and Combinations Investigation 1: Sessions 1 – 6 Investigation 3: Sessions 1 – 2 Putting Together and Taking Apart Investigation 1: Sessions 1, 3 – 4 Investigation 3: Session 1 Investigation 5: Sessions 2 – 5

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.2.2.4 **Apply number theory** • **determine if a 2-digit number is odd or even** • **use the terms sum, addends, and difference in an appropriate context (2+3=5, 2 and 3 are addends; 5 is a sum)**	• Coins, Coupons, and Combinations Investigation 2: Sessions 1 – 10 Investigation 4: Sessions 1 – 4 Putting Together and Taking Apart Investigation 2: Sessions 1 – 4 • Mathematical Thinking at Grade 2 Investigation 2: Sessions 1 – 3, 8 Investigation 5: Session 3 Coins, Coupons, and Combinations Investigation 1: Sessions 1 – 11 Investigation 3: Sessions 1 – 5 Investigation 4: Sessions 2 – 4 Putting Together and Taking Apart Investigation 1: Sessions 1 – 6 Investigation 3: Sessions 1 – 5 Investigation 4: Sessions 1 – 4 Investigation 5: Sessions 1 – 8
Whole Number Operations	
NO.2.2.5 Demonstrate various meaning of addition and subtraction **See Appendix for examples.**	Mathematical Thinking at Grade 2 Investigation 2: Sessions 1 – 3, 8 Investigation 5: Session 3 Coins, Coupons, and Combinations Investigation 1: Sessions 1 – 11 Investigation 3: Sessions 1 – 5 Investigation 4: Sessions 2 – 4 Putting Together and Taking Apart Investigation 1: Sessions 1- 6 Investigation 3: Sessions 1 – 5 Investigation 4: Sessions 1 – 4 Investigation 5: Sessions 1 – 8

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.2.2.6 Demonstrate various addition and subtraction relationships (property) to solve problems in contextual situations involving whole numbers	Mathematical Thinking at Grade 2 Investigation 2: Sessions 1 – 3, 8 Investigation 5: Session 3 Coins, Coupons, and Combinations Investigation 1: Sessions 1 – 11 Investigation 3: Sessions 1 – 5 Investigation 4: Sessions 2 – 4 Putting Together and Taking Apart Investigation 1: Sessions 1- 6 Investigation 3: Sessions 1 – 5 Investigation 4: Sessions 1 – 4 Investigation 5: Sessions 1 – 8
NO.2.2.7 Model, represent and explain division as sharing equally and repeated subtraction in contextual situations **Ex.** **Mrs. Lopez bought a dozen pencils for her four children. She gave each child the same number of pencils How many pencils did each child receive?**	Grade 3 Things That Come in Groups Investigation 3: Sessions 3 – 5 Investigation 4: Sessions 1 - 4

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates

Arkansas Mathematics	Investigations in Number, Data, & Space
Computational Fluency-Addition and Subtraction	
NO.3.2.1 Develop strategies for basic addition facts • **counting all** • **counting on** • **one more, two more** • **doubles** • **doubles plus one or minus one** • **make ten** • **using ten frames** • **Identity Property (adding zero)**	Mathematical Thinking at Grade 2 Investigation 2: Sessions 1 – 3 Investigation 5: Session 3 Coins, Coupons, and Combinations Investigation 1: Sessions 1 – 11 Investigation 3: Sessions 1 – 2 Investigation 4: Sessions 2 – 4 Putting Together and Taking Apart Investigation 1: Sessions 1, 3 – 6 Investigation 2: Sessions 1 – 7 Investigation 3: Session 1 Investigation 4: Sessions 1- 4 Investigation 5: Sessions 1 - 6
NO.3.2.2 Demonstrate multiple strategies for adding or subtracting 2-digit whole numbers • **Compatible Numbers** • **compensatory numbers** • **informal use of commutative and associative properties of addition**	Mathematical Thinking at Grade 2 Investigation 2: Sessions 1 – 3 Investigation 5: Session 3 Coins, Coupons, and Combinations Investigation 1: Sessions 1 – 11 Investigation 3: Sessions 1 – 2 Investigation 4: Sessions 2 – 4 Putting Together and Taking Apart Investigation 1: Sessions 1, 3 – 6 Investigation 2: Sessions 1 – 7 Investigation 3: Session 1 Investigation 4: Sessions 1- 4 Investigation 5: Sessions 1 – 6

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.3.2.3 Demonstrate computational fluency (accuracy, efficiency and flexibility) in addition facts with addends through 9 and corresponding subtractions **Ex.** **(9+9=18, 18-9=9)** **add and subtract multiples of ten**	Mathematical Thinking at Grade 2 Investigation 2: Sessions 1 – 3, 8 Investigation 5: Session 3 Coins, Coupons, and Combinations Investigation 1: Sessions 1 – 11 Investigation 3: Sessions 1 – 5 Investigation 4: Sessions 2 – 4 Putting Together and Taking Apart Investigation 1: Sessions 1- 6 Investigation 3: Sessions 1 – 5 Investigation 4: Sessions 1 – 4 Investigation 5: Sessions 1 – 8
Application of Computation	
NO.3.2.4 Solve problems using a variety of methods and tools (e.g., objects, mental computation, paper and pencil, and with and without appropriate technology)	Coins, Coupons, and Combinations Investigation 1: Sessions 10 – 11 Investigation 3: Sessions 4 – 5 Investigation 4: Session 5 Putting Together and Taking Apart Investigation 2: Session 7 Investigation 3: Sessions 2 – 5 Investigation 4: Sessions 3 – 4 Investigation 5: Sessions 1 – 8
Estimation	
NO.3.2.5 Use Estimation strategies to solve addition and subtraction problems and judge the reasonableness of the answer	Can be developed from: Coins, Coupons, and Combinations Investigation 1: Sessions 10 – 11 Investigation 3: Sessions 4 – 5 Investigation 4: Session 5 Putting Together and Taking Apart Investigation 2: Session 7 Investigation 3: Sessions 2 – 5 Investigation 4: Sessions 3 – 4 Investigation 5: Sessions 1 – 8

Strand: Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions

Arkansas Mathematics	Investigations in Number, Data, & Space
Sort and Classify	
A.4.2.1 Sort, classify, and label objects by three or more attributes in more than one way	Mathematical Thinking at Grade 2 Investigation 1: Sessions 2 – 4 Investigation 3: Sessions 3 – 5 Does It Walk, Crawl, or Swim? Investigation 1: Sessions 3 – 6 Shapes, Halves, and Symmetry Invesstigation1: Session 1
Recognize, Describe and Develop Patterns	
A.4.2.2 Describe repeating and growing patterns in the environment	Mathematical Thinking at Grade 2 Investigation 3: Sessions 1 – 4, 6 Timelines and Rhythm Patterns Investigation 2: Session 1 – 5
A.4.2.3 Use patterns to count forward and backward when given a number less than or equal to 100 ___, 69,___,___	Mathematical Thinking at Grade 2 Investigation 2: Sessions 4 – 5 Investigation 4: Sessions 1 – 4 Coins, Coupons, and Combinations Investigation 2: Sessions 1 – 10 Investigation 4: Sessions 1 – 4 Putting Together and Taking Apart Investigation 2: Sessions 1 – 7
A.4.2.4 Identify, describe and extend skip counting patterns from any given number	Mathematical Thinking at Grade 2 Investigation 4: Session 1 Coins, Coupons, and Combinations Investigation 2: Sessions 1 – 5, 10 Putting Together and Taking Apart Investigation 2: Sessions 1 – 2

Arkansas Mathematics	Investigations in Number, Data, & Space
Recognize, describe and develop patterns	
A.4.2.5 Identify a number that is more or less than any whole number less than 100 using multiples of ten **Ex.** **30 more than 26 is 56**	Mathematical Thinking at Grade 2 Investigation 4: Sessions 1 – 2 Coins, Coupons, and Combinations Investigation 2: Sessions 1 – 5, 10 Putting Together and Taking Apart Investigation 2: Sessions 1 – 4, 7 Investigation 4: Sessions 1 – 4
A.4.2.6 Recognize, describe, extend, and create repeating and growing patterns using a wide variety of materials to solve problems	Mathematical Thinking at Grade 2 Investigation 3: Sessions 1 – 4, 6 Investigation 4: Session 1 Coins, Coupons, and Combinations Investigation 2: Sessions 1 – 5, 10 Putting Together and Taking Apart Investigation 2: Sessions 1 – 2 Timelines and Rhythm Patterns Investigation 2: Sessions 1 – 5

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols

Arkansas Mathematics	Investigations in Number, Data, & Space
Expressions, Equations and Inequalities	
A.5.2.1 Select and/or write number sentences to find the unknown in problem- solving contexts involving two-digit addition and subtraction using appropriate labels **Ex.Mrs. Cole's class has 22 students. Ms River's class joined them on a field trip. When everyone got on a bus, there were 45 children. How many students are in Ms River's class?**	Coins, Coupons, and Combinations Investigation 1: Sessions 10 – 11 Investigation 3: Sessions 4 – 5 Investigation 4: Session 5 Putting Together and Taking Apart Investigation 1: Sessions 3 – 6 Investigation 3: Sessions 1 – 5 Investigation 4: Sessions 3 – 4 Investigation 5: Sessions 1 - 8
A.5.2.2 Express mathematical relationships using equalities and inequalities (>, <, =, ≠) Ex. **4 + 6 = 7 + 3** **3 + 5 < 4 + 5** **4 + 6 ≠ 7 + 5**	Mathematical Thinking at Grade 2 Investigation 2: Sessions 2 – 3 Investigation 5: Session 3 Coins, Coupons, and Combinations Investigation 1: Sessions 1 – 6, 10 Investigation 2: Sessions 3, 6 – 9 Investigation 4: Sessions 1 – 4 Putting Together and Taking Apart Investigation 2: Sessions 1 – 7 Investigation 4: Sessions 1 – 4 Investigation 5: Sessions 1 –
A.5.2.3 Recognize that symbols such as □, Δ and ◊ in an addition or subtraction equation, represent a missing value that will make the statement true **Ex.** **□ + 3 = 7** **Δ – 4 = 6** **8 – □ = 6** **6 = 8 – Δ**	Putting Together and Taking Apart Investigation 3: Sessions 1 - 5

Standard 6: Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships

Arkansas Mathematics	Investigations in Number, Data, & Space
Algebraic Models and Relationships	
A.6.2.1 Use a chart or table to organize information and to understand relationships Starfish / Arms 1 / 5 2 / 10 3 / 15 4 / 5 / 6 /	In an appendix at the end of each text is About Classroom Routines – How Many Pockets?. In this activity students develop tables and charts to organize information and to understand relationships.

Standard 7: Analysis of Change

Students shall analyze change in various contexts

Arkansas Mathematics	Investigations in Number, Data, & Space
Analyze Change	
A.7.2.1 Interpret and compare quantitative change **Ex.** **changes in temperature, age, height, etc. "The temperature this morning was 75 degrees. This afternoon is 85 degrees. What is the difference in the temperature?**	Can be developed from: Timelines and Rhythm Patterns Investigation 1: Sessions 1 - 6

Strand: Geometry

Standard 8: Geometric Properties

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships

Arkansas Mathematics	Investigations in Number, Data, & Space
Characteristics and Properties- Three Dimensional	
G.8.2.1 Identify, name, sort and describe 3-D solids (cube, sphere, rectangular prism, cone, and cylinder) according to the shapes of faces	Mathematical Thinking at Grade 2 Investigation 3: Sessions 1 – 5 Shapes, Halves and Symmetry Investigation 1: Sessions 1 – 8
G.8.2.2 Match three-dimensional objects to their two-dimensional faces	Mathematical Thinking at Grade 2 Investigation 3: Sessions 1 – 5 Shapes, Halves and Symmetry Investigation 1: Sessions 1 - 8
Characteristics and Properties- Two Dimensional	
G.8.2.3 Identify, classify and describe 2-D geometric figures (rectangle [including square], triangle and circle) using concrete objects drawings, and computer graphics	Mathematical Thinking at Grade 2 Investigation 3: Sessions 1 – 2 Shapes, Halves and Symmetry Investigation 1: Sessions 1- 8 Investigation 2: Sessions 1 - 6

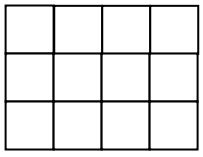
Standard 9: Transformation of Shapes

Students shall apply transformations and the use of symmetry to analyze mathematical situations

Arkansas Mathematics	Investigations in Number, Data, & Space
Symmetry and Transformations	
G.9.2.1 Use lines of symmetry to demonstrate and describe congruent figures within a 2-D figure **Ex.** **Letter, shapes, environmental print and polygons**	Shapes, Halves, and Symmetry Investigation 4: Sessions 1 - 7
G.9.2.2 Demonstrate the motion of a single transformation	Mathematical Thinking at Grade 2 Investigation 3: Sessions 1 – 4, 6 Shapes, Halves and Symmetry Investigation 1: Sessions 1 – 8 Investigation 2: Sessions 1 – 6

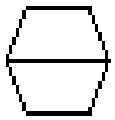
Standard 10: Coordinate Geometry

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems

Arkansas Mathematics	Investigations in Number, Data, & Space
Coordinate Geometry	
G.10.2.1 Extend the use of directional words to include rows and columns **Ex.** **This rectangle has 3 rows and 4 columns** 	Shapes, Halves and Symmetry Investigation 2: Sessions 3 - 6

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling

Arkansas Mathematics	Investigations in Number, Data, & Space
Spatial Visualization and Models	
G.11.2.1 Replicate a simple geometric design from a briefly displayed example or from a description	Shapes, Halves and Symmetry Investigation 1: Sessions 1 – 3 Investigation 2: Sessions 1, 4 - 6
G.11.2.2 Create new figures by combining and subdividing models of existing figures **Ex.** 	Shapes, Halves and Symmetry Investigation 1: Sessions 4 – 5 Investigation 2: Sessions 1 – 5 Investigation 4: Sessions 5 – 7

Strand: Measurement

Standard 12: Physical Attributes

Students shall use attributes of measurement to describe and compare mathematical and real-world objects

Arkansas Mathematics	Investigations in Number, Data, & Space
Time: Calendar	
M.12.2.1 Recognize that there are 12 months in a year and that each month has a specific number of days	Grade 1 Survey Questions and Secret Rules Investigation 3: Sessions 1 – 3

Arkansas Mathematics	Investigations in Number, Data, & Space
Time: Clock	
M.12.2.2 Recognize that there are 24 hours in a day	In an appendix at the end of each text is About Classroom Routines – Time and Time Again. This section engages the students in time-related ideas such as daily schedules, the passage of time and the duration of time periods.
Money	
M.12.2.3 State the value of all coins and a dollar	Mathematical Thinking at Grade 2 Investigation 4: Session 2 Coins, Coupons, and Combinations Investigation 2: Sessions 6 – 9 Putting Together and Taking Apart Investigation 2: Sessions 5 – 6 Investigation 4: Sessions 3 – 4
M.12.2.4 Compare the value of all coins	Mathematical Thinking at Grade 2 Investigation 4: Session 2 Coins, Coupons, and Combinations Investigation 2: Sessions 6 – 9 Putting Together and Taking Apart Investigation 2: Sessions 5 – 6 Investigation 4: Sessions 3 – 4
Temperature	
M.12.2.5 Compare temperatures using the Fahrenheit scale on a thermometer	Grade 1 In an appendix at the end of each text is Classroom Routines – Time and Change. This section consists of activities that explore units of time, relationships among them, daily schedules and weather.

Arkansas Mathematics	Investigations in Number, Data, & Space
Tools and Attributes	
M.12.2.6 Make simple comparisons within units of like dimension (units of length, mass/weight and capacity) **Ex.** **An inch is shorter than a foot.** **A pound is more than an ounce.** **A cup is less than a pint.**	How Long? How Far? Investigation 1: Sessions 1 – 8 Investigation 2: Sessions 4 - 5

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement

Arkansas Mathematics	Investigations in Number, Data, & Space
Calendar	
M.13.2.1 Use a calendar to determine elapsed time involving a time period within a given month	Grade 1 Survey Questions and Secret Rules Investigation 3: Sessions 1 – 3
Clock	
M.13.2.2 Tell time to the nearest 5-minute interval	In an appendix at the end of each text is About Classroom Routines – Time and Time Again. This section engages the students in time-related ideas such as daily schedules, the passage of time and the duration of time periods.

Arkansas Mathematics	Investigations in Number, Data, & Space
Elapsed Time	
M.13.2.3 Determine elapsed time in contextual situations in hour increments regardless of starting time **<u>End time unknown</u>** **Ex.** **Lunch began at 11:15 and lasted 1 hour. When was lunch over?** **<u>Elapsed hours unknown</u>** **Ex.** **John went to Tim's house at 3:20. He left at 5:20. How long did he stay?** **<u>Beginning time unknown</u>** **Ex.** **Mary watched a movie for 2 hours. The movie ended at 8:30. When did the movie begin?**	In an appendix at the end of each text is About Classroom Routines – Time and Time Again. This section engages the students in time-related ideas such as daily schedules, the passage of time and the duration of time periods.
Money	
M.13.2.4 Determine the value of a combination of coins up to the dollar	Mathematical Thinking at Grade 2 Investigation 4: Session 2 Coins, Coupons, and Combinations Investigation 2: Sessions 6 – 9 Putting Together and Taking Apart Investigation 2: Sessions 5 – 6 Investigation 4: Sessions 3 – 4
M.13.2.5 Demonstrate a given value of money up to $100 using a variety of coin combinations	Mathematical Thinking at Grade 2 Investigation 4: Session 2 Coins, Coupons, and Combinations Investigation 2: Sessions 6 – 9 Putting Together and Taking Apart Investigation 2: Sessions 5 – 6 Investigation 4: Sessions 3 – 4

Arkansas Mathematics	Investigations in Number, Data, & Space
M.13.2.6 Demonstrate a given value of money up to $100 using the fewest coins possible	Mathematical Thinking at Grade 2 Investigation 4: Session 2 Coins, Coupons, and Combinations Investigation 2: Sessions 6 – 9 Putting Together and Taking Apart Investigation 2: Sessions 5 – 6 Investigation 4: Sessions 3 – 4
M.13.2.7 Represent and write the value of money using the cent sign and in decimal form when using the dollar sign	Mathematical Thinking at Grade 2 Investigation 4: Session 2 Coins, Coupons, and Combinations Investigation 2: Sessions 6 – 9 Putting Together and Taking Apart Investigation 2: Sessions 5 – 6 Investigation 4: Sessions 3 – 4
M.13.2.8 Calculate the amount of money, spent with and without regrouping in a contextual situation Ex. • **A notebook costs 43¢ and a pencil costs 24¢. How much will Joe spend on these supplies?** • **Sue has 55¢. If pencils cost 10¢, how many can Sue buy? How much change will Sue get back?**	Mathematical Thinking at Grade 2 Investigation 4: Session 2 Coins, Coupons, and Combinations Investigation 2: Sessions 6 – 9 Putting Together and Taking Apart Investigation 2: Sessions 5 – 6 Investigation 4: Sessions 3 – 4
Temperature	
M.13.2.9 Read temperatures on a Fahrenheit scale in intervals of ten	Grade 1 In an appendix at the end of each text is Classroom Routines – Time and Change. This section consists of activities that explore units of time, relationships among them, daily schedules and weather.

Arkansas Mathematics	Investigations in Number, Data, & Space
Applications	
M.13.2.10 Select appropriate customary measurement tools (rulers, balance scale, cup and thermometer) for situations involving length, capacity, and mass	How Long? How Far? Investigation 1: Sessions 1 – 8 Investigation 2: Sessions 1 - 5
M.13.2.11 Estimate and measure length, capacity/volume and mass with non-standard units to recognize the need for standard units	How Long? How Far? Investigation 1: Sessions 1 – 8 Investigation 2: Sessions 1 - 5
Perimeter	
M.13.2.12 Determine perimeter using physical materials (paper clips, craft sticks or grids) and by using measurement tools (rulers)	Shapes, Halves and Symmetry Investigation 1: Sessions 2 – 5 Investigation 2: Sessions 2 - 6
Area	
M.13.2.12 Determine perimeter using physical materials (paper clips, craft sticks or grids) and by using measurement tools (rulers)	Shapes, Halves and Symmetry Investigation 1: Sessions 2 – 5 Investigation 2: Sessions 2 - 6
Applications	
M.13.2.14 Compare and order containers of various shapes and sizes according to their volume (Volume is determined by the number of cubic units to fill the container)	Grade 1 Bigger, Taller, Heavier, Smaller Investigation 2: Sessions 1 - 7

Strand: Data Analysis and Probability

Standard 14: Data Representation

Students shall formulate questions that can be addressed with data and collect, organize and display relevant data to answer them

Arkansas Mathematics	Investigations in Number, Data, & Space
Collect, Organize and display data	
DAP.14.2.1 Identify the purpose for data collection and collect, organize, record and display the data using physical materials (pictographs, Venn diagrams and vertical and horizontal bar graphs)	Mathematical Thinking at Grade 2 Investigation 2: Session 6 Investigation 5: Sessions 1 – 6 Coins, Coupons, and Combinations Investigation 1: Session 11 Does It Walk, Crawl or Swim? Investigation 1: Sessions 1 – 6 Investigation 2: Sessions 1 – 4 Investigation 3: Sessions 1 – 3 Investigation 4: Sessions 1 – 3 How Many Pockets? How Many Teeth? Investigation 1: Sessions 1 – 5 Investigation 2: Sessions 1 – 6 Investigation 3: Sessions 1 – 5

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data

Arkansas Mathematics	Investigations in Number, Data, & Space
Data Analysis	
DAP.15.2.1 Analyze and make predictions from data represented in charts and graphs	Mathematical Thinking at Grade 2 Investigation 2: Session 6 Investigation 5: Sessions 1 – 6 Coins, Coupons, and Combinations Investigation 1: Session 11 Does It Walk, Crawl or Swim? Investigation 1: Sessions 1 – 6 Investigation 2: Sessions 1 – 4 Investigation 3: Sessions 1 – 3 Investigation 4: Sessions 1 – 3 How Many Pockets? How Many Teeth? Investigation 1: Sessions 1 – 5 Investigation 2: Sessions 1 – 6 Investigation 3: Sessions 1 – 5
DAP.15.2.2 Make true statements comparing data displayed on a graph or chart **Ex** **More children chose pizza than chicken** 7 X 6 X 5 X X 4 X X 3 X X X 2 X X X 1 X X X pzza Hot dogs chicken	Mathematical Thinking at Grade 2 Investigation 2: Session 6 Investigation 5: Sessions 1 – 6 Coins, Coupons, and Combinations Investigation 1: Session 11 Does It Walk, Crawl or Swim? Investigation 1: Sessions 1 – 6 Investigation 2: Sessions 1 – 4 Investigation 3: Sessions 1 – 3 Investigation 4: Sessions 1 – 3 How Many Pockets? How Many Teeth? Investigation 1: Sessions 1 – 5 Investigation 2: Sessions 1 – 6 Investigation 3: Sessions 1 – 5

Standard 16: Inferences and Predictions

Students shall develop and evaluate inferences and predictions that are based on data

Arkansas Mathematics	Investigations in Number, Data, & Space
Inferences and Predictions	
DAP.16.2.1 Make simple predictions for a given set of data	Mathematical Thinking at Grade 2 Investigation 2: Session 6 Investigation 5: Sessions 1 – 6 Coins, Coupons, and Combinations Investigation 1: Session 11 Does It Walk, Crawl or Swim? Investigation 1: Sessions 1 – 6 Investigation 2: Sessions 1 – 4 Investigation 3: Sessions 1 – 3 Investigation 4: Sessions 1 – 3 How Many Pockets? How Many Teeth? Investigation 1: Sessions 1 – 5 Investigation 2: Sessions 1 – 6 Investigation 3: Sessions 1 – 5

Standard 17: Probability

Students shall understand and apply basic concepts of probability

Arkansas Mathematics	Investigations in Number, Data, & Space
Probability	
DAP.17.2.1 Describe the probability of an event as being more, less, and equally likely to occur **Ex.** **There are 5 blue cubes, 8 red cubes, and 1 yellow cube in this bag. Which color are you more/less likely to pull from this bag?**	The concept of probability is introduced in Grade 3. Students in Grade 2 may identify possible outcomes based on collected data: Does It Walk, Crawl or Swim? Investigation 2: Sessions 3 – 4 How Many Pockets? How Many Teeth? Investigation 2: Sessions 3, 6

Investigations in Number, Data, & Space
to the
Arkansas Mathematics Curriculum Framework

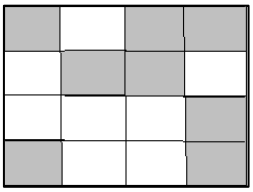
Grade Three

Strand: Number and Operations

Standard 1 Number Sense:

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems

Arkansas Mathematics	Investigations in Number, Data, & Space
Whole Numbers	
NO.1.3.1 Recognize equivalent representations for the same whole number and generate them by composing and decomposing numbers Ex. 352 = 300 + 50 + 2; 300 + 25 + 25 + 2; 150 + 150 + 50 + 2, etc	Mathematical Thinking at Grade 3 Investigation 1: Session 1 Landmarks in the Hundreds Investigation 2: Sessions 1 - 3
NO.1.3.2 Use the place-value structure of the base-ten number system and be able to represent and compare whole numbers including thousands (using models, illustrations, symbols, expanded notation and problem solving) Ex. 2,308___2,038	Mathematical Thinking at Grade 3 Investigation 1: Sessions 1 – 3 Things That Come in Groups Investigation 2: Sessions 1 – 6 Landmarks in the Hundreds Investigation 3: Sessions 1 - 3
NO.1.3.3 Use mathematical language and symbols to compare and order 4 digit numbers with and without appropriate technology (<, >, =)	Mathematical Thinking at Grade 3 Investigation 3: Sessions 3 – 4 Landmarks in the Hundreds Investigation 3: Sessions 1 – 3

Arkansas Mathematics	Investigations in Number, Data, & Space
Rational Numbers	
NO.1.3.4 Represent fractions (halves, thirds, fourths, sixths and eighths) using words, numerals and physical models **Ex.** **• identify and illustrate parts of a whole and parts of sets of objects.** **• recognize that a fractional part of a rectangle does not have to be shaded with contiguous parts** 	Fair Shares Investigation 1: Sessions 1 – 4 Investigation 2: Sessions 1 - 7
NO.1.3.5 Utilize models to recognize that the size of the whole determines the size of the fraction depending on the original quantity	Fair Shares Investigation 1: Sessions 1 – 4 Investigation 2: Sessions 1 – 7
NO.1.3.6 Use the place-value structure of the base-ten number system and be able to represent and compare decimals to hundredths in money (using models, illustrations, symbols, expanded notation and problem solving) **Ex.** **$19376 ____ $13967**	Landmarks in the Hundreds Investigation 1: Sessions 6 – 7 Investigation 2: Session 4

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.1.3.7 Write a fraction that is equivalent to a given fraction with the use of models **Ex.** **1/2 = 4/8 = 8/16**	Fair Shares Investigation 1: Sessions 1 – 4 Investigation 2: Sessions 1 – 7

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another

Arkansas Mathematics	Investigations in Number, Data, & Space
Number Theory	
NO.2.3.1 Develop an understanding of the commutative and identity properties of multiplication using objects	Things That Come in Groups Investigation 1: Sessions 1 – 4 Investigation 3: Sessions 3 – 4
NO.2.3.2 Apply number theory • **determine if a 3-digit number is even or odd** • **use the terms multiple, factor, product and quotient in an appropriate context (e.g., Since 3x4=12, 3 and 4 are factors; 12 is the product , 3,6,9,12 are multiples of 3; 4, 8,12,16 are multiples of 4; 12 ÷ 4 = 3, the quotient)**	• Mathematical Thinking at Grade 3 Investigation 4: Sessions 1 – 3 • Things That Come in Groups Investigation 2: Sessions 3 – 5 Investigation 3: Sessions 1 – 5 Landmarks in the Hundreds Investigation 1: Sessions 1 – 5 Investigation 2: Sessions 1 - 4
Whole Number Operations	
NO.2.3.3 Use conventional mathematical symbols to write equations for contextual problems involving multiplication **See Appendix for examples**	Things That Come in Groups Investigation 1: Sessions 3 – 4 Investigation 4: Sessions 1 – 4 Landmarks in the Hundreds Investigation 2: Sessions 4 – 6

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.2.3.4 Model, represent and explain division as measurement and partitive division including equal groups, related rates, price, rectangular arrays (area model), combinations and multiplicative comparison See Appendix for more details **Ex.** • **translate contextual situations involving division into conventional mathematical symbols** • **explain how a remainder may impact an answer in a real-world situation**	Things That Come in Groups Investigation 1: Sessions 3 – 4 Investigation 4: Sessions 1 – 4 Landmarks in the Hundreds Investigation 1: Sessions 6 – 7 Investigation 2: Sessions 4 - 6

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates

Arkansas Mathematics	Investigations in Number, Data, & Space
Computational Fluency-Addition and Subtraction	
NO.3.3.1 **Develop, with and without appropriate technology, computational fluency, in multi-digit addition and subtraction through 999 using contextual problems** • **strategies for adding and subtracting numbers** • **Estimation of sums and differences in appropriate situations** • **relationships between operations**	Mathematical Thinking at Grade 3 Investigation 2: Session 2 Combining and Comparing Investigation 1: Sessions 1 – 3 Investigation 4: Sessions 1 – 4

Arkansas Mathematics	Investigations in Number, Data, & Space
Computational Fluency-Multiplication and Division	
NO.3.3.2 **Develop, with and without appropriate technology, fluency with basic number combinations for multiplication and division facts (10 x 10)**	Things That Come in Groups Investigation 1: Sessions 1 – 4 Investigation 2: Sessions 1 – 6 Investigation 3: Sessions 1 – 5 Landmarks in the Hundreds Investigation 1: Sessions 1 – 5 Investigation 2: Sessions 1 – 4
NO.3.3.3 **Develop, with and without appropriate technology, computational fluency in multiplication and division up to two-digit by one-digit numbers using two-digit by one-digit number contextual problems using** **• strategies for multiplying and dividing numbers,** **• performance of operations in more than one way,** **• Estimation of products and quotients in appropriate situations, and** **• relationships between operations**	Things That Come in Groups Investigation 1: Sessions 1 – 4 Investigation 2: Sessions 1 – 6 Investigation 3: Sessions 1 – 5 Investigation 4: Sessions 1 – 4 Landmarks in the Hundreds Investigation 1: Sessions 1 – 7 Investigation 2: Sessions 1 – 6
Application of Computation	
NO.3.3.4 **Solve simple problems using one operation involving addition and subtraction using a variety of methods and tools** **(e.g., objects, mental computation, paper and pencil and with and without appropriate technology)**	Mathematical Thinking at Grade 3 Investigation 2: Session 2 Combining and Comparing Investigation 1: Sessions 1 – 2 Investigation 4: Sessions 1 – 4

Arkansas Mathematics	Investigations in Number, Data, & Space
Estimation	
NO.3.3.5 **Use Estimation strategies to solve problems and judge the reasonableness of the answer**	Mathematical Thinking at Grade 3 Investigation 3: Sessions 3 – 4 From Paces to Feet Ten-Minute Math: Estimation and Number Sense Landmarks in the Hundreds Investigation 3: Sessions 2 – 3 Combining and Comparing Investigation 3: Sessions 1 – 2 Investigation 4: Sessions 1 – 4

Strand: Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions

Arkansas Mathematics	Investigations in Number, Data, & Space
Recognize, Describe and Develop Patterns	
A.4.4.1 Count forward and backward when given a number less than or equal to 1000 ____, 399,___,____	Mathematical Thinking at Grade 3 Investigation 1: Sessions 1 – 3 Investigation 3: Sessions 1 – 3
A.4.4.2 Relate skip-counting patterns to multiplication	Mathematical Thinking at Grade 3 Investigation 1: Sessions 1 – 3 Things That Come in Groups Investigation 2: Sessions 1 – 6 Investigation 3: Sessions 3 – 4 Landmarks in the Hundreds Investigation 1: Sessions 1 – 5

Arkansas Mathematics	Investigations in Number, Data, & Space
A.4.3.3 Identify a number that is more or less than any whole number up to 1000 using multiples of ten and/or 100 Ex. **100 less than 587 is 487 10 more than196 is 206**	Can be developed from: Mathematical Thinking at Grade 3 Investigation 1: Sessions 1 – 3 Landmarks in the Hundreds Investigation 3: Sessions 1 – 3 Combining and Comparing Investigation 1: Sessions 1 – 3 Investigation 4: Sessions 1 – 2
A.4.3.4 Use repeating and growing numeric or geometric patterns to solve problems	Mathematical Thinking at Grade 3 Investigation 1: Sessions 1 – 3 Things That Come in Groups Investigation 2: Sessions 1 – 6 Investigation 3: Sessions 3 – 4 Flips, Turns, and Area Investigation 1: Session 1 Landmarks in the Hundreds Investigation 1: Sessions 1 – 5
Patterns Relations and Functions	
A.4.3.5 Determine the relationship between sets of numbers by selecting the rule (1 step rule in words)	Things That Come in Groups Investigation 5: Sessions 1 – 4 Fair Shares Investigation 2: Sessions 5 – 6

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols

Arkansas Mathematics	Investigations in Number, Data, & Space
Expressions, Equations and Inequalities	
A.5.3.1 Select and/or write number sentences (equations) to find the unknown in problem- solving contexts involving two-digit times one-digit multiplication using appropriate labels	Things That Come in Groups Investigation 4: Sessions 1 – 4
A.5.3.2 Express mathematical relationships using equalities and inequalities (>, <, =, ≠) Ex. **4 x 9 ____ 36 - 3**	Mathematical Thinking at Grade 3 Investigation 3: Sessions 3 – 4 Fair Shares Investigation 2: Sessions 1 – 4 Combining and Comparing Investigation 1: Sessions 1 – 3 Investigation 4: Session 2
A.5.3.3 Use a symbol to represent an unknown quantity in a number sentence involving contextual situations and find the value **Ex.** **Mary buys two bags of candy with the same number of pieces in each bag. If she has sixteen pieces in all, how many pieces of candy are in each bag?** **2 x ˜ = 16**	Things That Come in Groups Investigation 1: Session 3 Investigation 4: Sessions 1 – 4 Up and Down the Number Line Investigation 1: Sessions 6 – 7

Standard 6: Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships

Arkansas Mathematics	Investigations in Number, Data, & Space
Algebraic Models and Relationships	
A.6.3.1 Complete a chart or table to organize given information and to understand relationships and explain the results **Ex. The library has 5 workstations. Four students can sit at each station How many students can sit at all the stations?** **stations / students** **1 / 4** **2 / ?** **3 / ?** **4 / ?** **5 / ?**	Things That Come in Groups Investigation 5: Sessions 3 – 4

Standard 7: Analysis of Change

Students shall analyze change in various contexts

Arkansas Mathematics	Investigations in Number, Data, & Space
Analyze Change	
A.7.3.1 Identify the change over time **Ex. We have recorded the morning and afternoon temperatures all week Which day had the greatest change in temperature?**	Up and Down the Number Line Investigation 1: Sessions 1 – 8 Investigation 2: Sessions 1 – 4

Strand: Geometry

Standard 8: Geometric Properties

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships

Arkansas Mathematics	Investigations in Number, Data, & Space
Characteristics and Properties- Three Dimensional	
G.8.3.1 Compare, contrast and build 3-D solids by investigating the number of faces, edges, and vertices on models	Exploring Solid and Boxes Investigation 1: Sessions 1 – 2 Investigation 2: Sessions 3 – 5 Investigation 3: Sessions 1 – 2
Characteristics and Properties- Two Dimensional	
G.8.3.2 Identify regular polygons with at least 4 sides (square, pentagon, hexagon and octagon)	Flips, Turns, and Area Investigation 2: Sessions 1 – 3 Exploring Solids and Boxes Investigation 2: Sessions 1 – 2
Characteristics and Properties— One Dimensional	
G.8.3.3 Identify and draw line, line segment and ray using appropriate labels	Turtle Paths Investigation 1: Session 1 Investigation 2: Sessions 1 – 3
Geometric Relationships	
G.8.3.4 Identify and draw intersecting and parallel lines	Turtle Paths Investigation 1: Session 1 Investigation 2: Sessions 1 – 3

Standard 9: Transformation of Shapes

Students shall apply transformations and the use of symmetry to analyze mathematical situations

Arkansas Mathematics	Investigations in Number, Data, & Space
Symmetry and Transformations	
G.9.3.1 Draw one or more lines of symmetry in a polygon	Mathematical Thinking at Grade 3 Investigation 2: Session 1
G.9.3.2 Describe the motion (transformation) of a two-dimensional figure as a flip (reflection), slide (translation) or turn (rotation)	Flips, Turns, and Area Investigation 1: Sessions 2 – 3

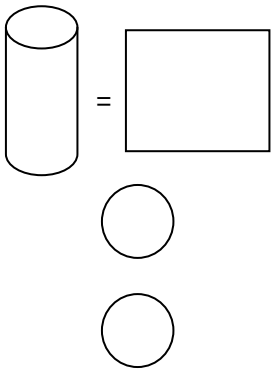
Standard 10: Coordinate Geometry

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems

Arkansas Mathematics	Investigations in Number, Data, & Space
Coordinate Geometry	
G.10.3.1 Locate and identify points on a coordinate grid and name the ordered pair (quadrant one only) using common language and geometric vocabulary (horizontal and vertical)	Up and Down the Number Line Investigation 2: Sessions 1 – 4

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling

Arkansas Mathematics	Investigations in Number, Data, & Space
Spatial Visualization and Models	
G.11.3.1 **Replicate a three-dimensional model composed of cubes when given a physical model**	Exploring Solids and Boxes Investigation 3: Sessions 1 – 2 Investigation 5: Sessions 1 – 4
G.11.3.2 Determine which new figure will be formed by combining and subdividing models of existing figures **Ex.** 	Exploring Solids and Boxes Investigation 1: Sessions 1 – 2

Strand: Measurement

Standard 12: Physical Attributes

Students shall use attributes of measurement to describe and compare mathematical and real-world objects

Arkansas Mathematics	Investigations in Number, Data, & Space
Time: Calendar	
M.12.3.1 Determine the number of days in a month, days in a year and identify the number of weeks in a year	Combining and Comparing Investigation 5: Sessions 1 – 3
Time: Clock	
M.12.3.2 Recognize that 60 minutes equals 1 hour and that a day is divided into A.M. and P.M.	Can be developed from: Combining and Comparing Investigation 5: Sessions 1 – 3
Temperature	
M.12.3.3 Distinguish the temperature in contextual problems using the Fahrenheit scale on a thermometer Ex. If I need to wear mittens and a scarf, what temperature would it be? 35° F or 70° F?	Can be developed from: Up and Down the Number Line Investigation 1: Sessions 1 – 2, 8
Tools and Attributes	
M.12.3.4 Demonstrate the relationship among different standard units <u>Length</u>: **12 in = 1 ft,** **3 ft = 1 yd,** **36 in = 1 yd** **<u>Capacity:</u>** **2 cups = 1 pint,** **2 pints = 1 quart** **4 quarts = 1gallon** **<u>Weight:</u>** **16 ounces = 1 lb**	From Paces to Feet Investigation 2: Sessions 1 – 7 Investigation 3: Sessions 1 – 3 Investigation 4: Sessions 1 – 3 Combining and Comparing Investigation 2: Sessions 1 – 2

M.12.3.5 Create and complete a conversion table (from larger unit to smaller unit) to show relationships between units of measurement in the same system **Ex. change feet to inches using multiplication**	From Paces to Feet Investigation 2: Sessions 1 – 7 Investigation 3: Sessions 1 – 3 Investigation 4: Sessions 1 – 3 Combining and Comparing Investigation 2: Sessions 1 – 2

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement

Arkansas Mathematics	Investigations in Number, Data, & Space
Calendar	
M.13.3.1 Use a calendar to determine elapsed time from month to month	Combining and Comparing Investigation 5: Sessions 1 – 3
Clock	
M.13.3.2 Tell time to the nearest 1-minute intervals	Grade 2 – In an appendix at the end of each text is About Classroom Routines – Time and Time Again. This section engages the students in time-related ideas such as daily schedules, the passage of time and duration of time periods.
M.13.3.3 Express time to the half hour and quarter hour using the terms half-past, quarter after, quarter -until	Grade 2 – In an appendix at the end of each text is About Classroom Routines – Time and Time Again. This section engages the students in time-related ideas such as daily schedules, the passage of time and duration of time periods.

Arkansas Mathematics	Investigations in Number, Data, & Space
Elapsed Time	
M.13.3.4 Determine elapsed time in contextual situations to five-minute intervals **<u>End time unknown</u>** **Ex. Lunch began at 10:45 and lasted 25 minutes. When was lunch over?** **<u>Elapsed hours unknown</u>** **Ex. John went to Tim's house at 3:15. He left at 4:20. How long did he stay?**	Grade 2 – In an appendix at the end of each text is About Classroom Routines – Time and Time Again. This section engages the students in time-related ideas such as daily schedules, the passage of time and duration of time periods.
Money	
M.13.3.5 Determine the value of money up to $10	Mathematical Thinking at Grade 3 Investigation 2: Sessions 5 – 7 Things That Come in Groups Investigation 5: Session 1 Landmarks in the Hundreds Investigation 1: Sessions 6 – 7 Investigation 2: Session 4
M.13.3.6 Apply money concepts in contextual situations up to $1000 **Ex.** **• determine change with the least amount of currency** **• compare money**	Mathematical Thinking at Grade 3 Investigation 2: Sessions 5 – 7 Things That Come in Groups Investigation 5: Session 1 Landmarks in the Hundreds Investigation 1: Sessions 6 – 7 Investigation 2: Session 4
Temperature	
M.13.3.7 Read temperatures on Fahrenheit and Celsius scales in intervals of two and five	Can be developed from: Up and Down the Number Line Investigation 1: Sessions 1 – 2, 8

Arkansas Mathematics	Investigations in Number, Data, & Space
Applications	
M.13.3.8 Use appropriate customary measurement tools for length, capacity and mass	From Paces to Feet Investigation 2: Sessions 1 – 7 Investigation 3: Sessions 1 – 3 Investigation 4: Sessions 1 – 3 Combining and Comparing Investigation 2: Sessions 1 – 2
M.13.3.9 Estimate and measure length, capacity/volume and mass using appropriate customary units **Length: 1 inch** **Perimeter: inches, feet, etc** **Area: square inches (use models)** **Weight : pounds/ounces** **Capacity: cups, pints, quarts, gallons**	Flips, Turns, and Area Investigation 2: Sessions 1 – 5 From Paces to Feet Investigation 2: Sessions 1 – 7 Investigation 3: Sessions 1 – 3 Investigation 4: Sessions 1 – 3 Combining and Comparing Investigation 2: Sessions 1 – 2 Exploring Solids and Boxes Investigation 4: Sessions 1 – 3
Perimeter	
M.13.3.10 Find the perimeter of a figure by measuring the length of the sides	Turtle Paths Investigation 3: Sessions 1 – 5 Ten-Minute Math: Lengths and Perimeters
Area	
M.13.3.11 Find the area of any region counting squares and half-squares	Flips, Turns, and Areas Investigation 1: Sessions 4 – 5 Investigation 2: Sessions 1 – 5
Applications	
M.13.3.12 Develop strategies for finding the volume (cubic units) of rectangular prisms and cubes using models	Exploring Solids and Boxes Investigation 4: Sessions 1 – 3

Strand: Data Analysis and Probability

Standard 14: Data Representation

Students shall formulate questions that can be addressed with data and collect, organize and display relevant data to answer them

Arkansas Mathematics	Investigations in Number, Data, & Space
Collect, Organize and display data	
DAP.14.3.1 Design a survey question after being given a topic and collect, organize, display and describe simple data using frequency tables or line plots, pictographs, and bar graphs	Mathematical Thinking at Grade 3 Investigation 3: Sessions 1 – 4 Ten-Minute Math: Exploring Data Things That Come in Groups Investigation 5: Sessions 2 – 3 From Paces to Feet Investigation 1: Sessions 1 – 2, 5 – 6 Investigation 2: Session 2 Investigation 3: Sessions 1 – 3

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data

Arkansas Mathematics	Investigations in Number, Data, & Space
Data Analysis	
DAP.15.3.1 Read and interpret pictographs and bar graphs in which symbols or intervals are greater than one	Mathematical Thinking at Grade 3 Investigation 3: Sessions 1 - 2
DAP.15.3.2 Match a set of data with a graphical representation of the data	Mathematical Thinking at Grade 3 Investigation 3: Sessions 1 – 4 Ten-Minute Math: Exploring Data Things That Come in Groups Investigation 5: Sessions 2 – 3 From Paces to Feet Investigation 1: Sessions 1 – 2, 5 – 6 Investigation 2: Session 2 Investigation 3: Sessions 1 – 3

Standard 16: Inferences and Predictions

Students shall develop and evaluate inferences and predictions that are based on data

Arkansas Mathematics	Investigations in Number, Data, & Space
Inferences and Predictions	
DAP.16.3.1 Make predictions for a given set of data	Mathematical Thinking at Grade 3 Investigation 3: Sessions 1 – 4 Ten-Minute Math: Exploring Data Things That Come in Groups Investigation 5: Sessions 2 – 3 From Paces to Feet Investigation 1: Sessions 1 – 2, 5 – 6 Investigation 2: Session 2 Investigation 3: Sessions 1 – 3

Standard 17: Probability

Students shall understand and apply basic concepts of probability

Arkansas Mathematics	Investigations in Number, Data, & Space
Probability	
DAP.17.3.1 Use fractions to predict probability of an event **Ex. If there were 5 blue tiles, 3 red tiles, and 2 green tiles in a bag What is the probability you would pull out a green tile?**	Things That Come in Groups Ten-Minute Math: Likely or Unlikely? Exploring Solids and Boxes Ten-Minute Math: What is Likely?
DAP.17.3.2 Conduct simple probability experiments, record the data and draw conclusions about the likelihood of possible outcomes (roll number cubes, pull tiles from a bag, spin a spinner, or determine the fairness of games)	Things That Come in Groups Ten-Minute Math: Likely or Unlikely? Exploring Solids and Boxes Ten-Minute Math: What is Likely?

Arkansas Mathematics	Investigations in Number, Data, & Space
DAP.17.3.3 Use physical models, pictures, and organized lists to find combinations of two sets of objects Ex. Sarah has a red shirt, white shirt, and blue shirt .She also has a pair of kaki pants and blue pants. How many different combinations of shirts and pants can she wear?	Things That Come in Groups Ten-Minute Math: Likely or Unlikely? Exploring Solids and Boxes Ten-Minute Math: What is Likely?

Investigations in Number, Data, & Space
to the
Arkansas Mathematics Curriculum Framework

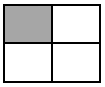
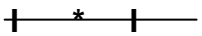
Grade Four

Strand: Number and Operations

Standard 1 Number Sense:

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems

Arkansas Mathematics	Investigations in Number, Data, & Space
Whole Numbers	
NO.1.4.1 Recognize equivalent representations for the same whole number and generate them by composing and decomposing numbers Ex. 1,076 = 1,000 + 70 + 6, 500 + 500 + 25 + 25 + 25 + 1; 250 + 250 + 250 + 250 + 75 + 1, etc…	Arrays and Shares Investigation 1: Session 3 Landmarks in the Thousands Investigation 2: Session 1 Investigation 3: Sessions 1 – 2 Investigation 4: Sessions 1 – 3
NO.1.4.2 Use the place-value structure of the base-ten number system and be able to represent and compare whole numbers to millions (using models, illustrations, symbols, expanded notation and problem solving) Ex. 1,246,477___1,244	Mathematical Thinking at Grade 4 Investigation 1: Sessions 2 – 4 Investigation 3: Sessions 1 – 2 Arrays and Shares Investigation 1: Sessions 1 – 2 Landmarks in the Thousands Investigation 4: Sessions 1 – 3
NO.1.4.3 Use mathematical language and symbols to compare and order any whole numbers with and without appropriate technology (<, >, =)	Mathematical Thinking at Grade 4 Investigation 3: Sessions 3 Landmarks in the Thousands Investigation 3: Session 1 Investigation 4: Sessions 1 – 3 Money, Miles, and Large Numbers Investigation 3: Session 1

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.1.4.4 Write a fraction to name part of a whole, part of a set, a location on a number line, and the division of whole numbers, using models up to 12/12 **Ex.** **¼**   **¼ =**  **¼ =**  **0 ¼ ½ 1** **¼ = One cookie shared by 4 children**	Different Shapes, Equal Pieces Investigation 1: Sessions 1 – 5 Investigation 2: Sessions 1 – 4 Investigation 3: Sessions 1 – 5 Three Out of Four Like Spaghetti Investigation 1: Sessions 2 – 4
Rational Numbers	
NO.1.4.5 Utilize models, benchmarks, and equivalent forms to recognize that the size of the whole determines the size of the fraction	Different Shapes, Equal Pieces Investigation 1: Sessions 1 – 5 Investigation 2: Sessions 1 – 4 Investigation 3: Sessions 1 – 5 Three Out of Four Like Spaghetti Investigation 1: Sessions 2 – 4
NO.1.4.6 Use the place-value structure of the base-ten number system and be able to represent and compare decimals to hundredths (using models, illustrations, symbols, expanded notation and problem solving) **Ex. 3.87___3.78**	Money, Miles, and Large Numbers Investigation 1: Sessions 4 – 5 Investigation 2: Sessions 1 – 2, 4

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.1.4.7 **Write an equivalent decimal for a given fraction relating to money** **Ex. 1/10 = $010, 1/4 = $025**	Can be developed from: Money, Miles, and Large Numbers Investigation 1: Sessions 4 – 5
NO.1.4.8 **Write a fraction that is equivalent to a given fraction with the use of models** **Ex. 1/3 = 2/6 = 4/12**	Different Shapes, Equal Pieces Investigation 1: Session 5 Investigation 2: Session 3

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another

Arkansas Mathematics	Investigations in Number, Data, & Space
Number Theory	
NO.2.4.1 **Develop an understanding of the associative and zero properties of multiplication using objects**	Arrays and Shares Investigation 1: Session 1 – 3 Investigation 2: Session 1 – 6 Investigation 3: Session 1
NO.2.4.2 **Apply number theory** • **determine if any number is even or odd** • **use the terms multiple, factor, and divisible by in an appropriate context** • **generate and use divisibility rules for 2, 5, and 10** • **demonstrate various multiplication & division relationships**	Arrays and Shares Investigation 1: Sessions 1 – 3 Investigation 2: Sessions 1 – 8 Investigation 3: Sessions 1 – 5 Packages and Groups Investigation 1: Sessions 1 – 5 Investigation 2: Sessions 1 – 3 Investigation 3: Sessions 1 – 10

Arkansas Mathematics	Investigations in Number, Data, & Space
Whole Number Operations	
NO.2.4.3 Use conventional mathematical symbols to write equations for contextual problems involving multiplication **See Appendix for examples**	Packages and Groups Investigation 2: Sessions 2 – 3 Investigation 3: Sessions 4 – 6
NO.2.4.4 Represent and explain division as measurement and partitive division including equal groups, related rates, price, rectangular arrays (area model), combinations and multiplicative comparison See Appendix for more details **Ex.** • **translate contextual situations involving division into conventional mathematical symbols** • **explain how a remainder may impact an answer in a real-world situation**	Arrays and Shares Investigation 1: Session 3 Investigation 2: Sessions 7 – 8 Investigation 3: Sessions 2 – 4 Packages and Groups Investigation 3: Sessions 1 – 10

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates

Arkansas Mathematics	Investigations in Number, Data, & Space
Computational Fluency-Addition and Subtraction	
NO.3.4.1 Demonstrate, with and without appropriate technology, computational fluency in multi-digit addition and subtraction in contextual problems	Mathematical Thinking at Grade 4 Investigation 2: Sessions 1 – 4 Investigation 3: Sessions 1 – 5 Landmarks in the Thousands Investigation 1: Session 3 Investigation 2: Sessions 2 – 4 Investigation 3: Sessions 2 – 5 Investigation 4: Sessions 1 – 3 Money, Miles, and Large Numbers Investigation 1: Sessions 1 – 5 Investigation 2: Sessions 1 – 2
Computational Fluency-Multiplication and Division	
NO.3.4.2 Demonstrate fluency with combinations for multiplication and division facts (12 x 12) and use these combinations to mentally compute related problems (30 x 50)	Arrays and Shares Investigation 1: Sessions 1 – 3 Investigation 2: Sessions 1 – 8 Investigation 3: Sessions 1 – 5 Packages and Groups Investigation 1: Sessions 1 – 5 Investigation 3: Sessions 1 – 10

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.3.4.3 **Attain, with and without appropriate technology, computational fluency in multiplication and division using contextual problems using** **• two-digit by two-digit multiplication (larger numbers with technology),** **• up to three-digit by two digit division (larger numbers with technology),** **• strategies for multiplication and dividing numbers,** **• performance of operations in more than one way,** **• Estimation of products and quotients in appropriate situations, and** **• relationships between operations**	Arrays and Shares Investigation 1: Sessions 1 – 3 Investigation 2: Sessions 1 – 8 Investigation 3: Sessions 1 – 5 Packages and Groups Investigation 1: Sessions 1 – 5 Investigation 2: Sessions 1 – 3 Investigation 3: Sessions 1 – 10
Application of Computation	
NO.3.4.4 Solve simple problems using operations involving addition, subtraction, and multiplication using a variety of methods and tools (e.g., objects, mental computation, paper and pencil and with and without appropriate technology)	Mathematical Thinking at Grade 4 Investigation 2: Sessions 1 – 4 Investigation 3: Sessions 3 – 5 Arrays and Shares Investigation 1: Sessions 1 – 3 Investigation 2: Sessions 1 – 6 Investigation 3: Session 1, 5 Landmarks in the Thousands Investigation 1: Session 3 Investigation 2: Sessions 2 – 5 Investigation 3: Sessions 2 – 5 Investigation 4: Sessions 1 – 3 Packages and Groups Investigation 1: Sessions 4 – 5 Investigation 2: Sessions 1 – 3

Arkansas Mathematics	Investigations in Number, Data, & Space
Estimation	
NO.3.4.5 Use Estimation strategies to solve problems and judge the reasonableness of the answer	Mathematical Thinking at Grade 4 Investigation 1: Sessions 2 – 3 Landmarks in the Thousands Investigation 3: Sessions 3 – 5 Packages and Groups Investigation 2: Sessions 2 – 3 The Shape of the Data Ten-Minute Math: Estimation and Number Sense

Strand: Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions

Arkansas Mathematics	Investigations in Number, Data, & Space
Recognize, Describe and Develop Patterns	
A.4.4.1 Identify a number that is more or less than any whole number using multiples of 10, 100 and/or 1000 **Ex. 100 more than 4987 is 5087**	Mathematical Thinking at Grade 4 Investigation 3: Sessions 1 – 2 Landmarks in the Thousands Investigation 1: Session 3 Investigation 2: Session 1 Investigation 3: Sessions 1 – 2 Investigation 4: Sessions 1 – 3

Arkansas Mathematics	Investigations in Number, Data, & Space
A.4.4.2 Use repeating and growing numeric and geometric patterns to make predictions and solve problems	Mathematical Thinking at Grade 4 Investigation 4: Sessions 1 – 6 Arrays and Shares Investigation 1: Sessions 1 – 3 Investigation 2: Session 1 Landmarks in the Thousands Investigation 1: Sessions 1 – 3 Investigation 3: Sessions 1 – 2 Investigation 4: Sessions 1 – 3 Packages and Groups Investigation 1: Sessions 1 – 5 Investigation 3: Sessions 4 – 6
Patterns, Relations and Functions	
A.4.4.3 Determine the relationship between sets of numbers by selecting the rule (2 step rule in words)	Can be developed from: Arrays and Shares Investigation 2: Sessions 1 – 4 Ten-Minute Math: Multiple BINGO Landmarks in the Thousands Investigation 1: Session 3 Investigation 2: Session 1 Investigation 4: Sessions 1 – 3

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols

Arkansas Mathematics	Investigations in Number, Data, & Space
Expressions, Equations and Inequalities	
A.5.4.1 Select and/or write number sentences (equations) to find the unknown in problem-solving contexts involving two-digit by one-digit division using appropriate labels	Arrays and Shares Investigation 3: Sessions 2 – 4 Packages and Groups Investigation 3: Sessions 1 – 10

Arkansas Mathematics	Investigations in Number, Data, & Space
A.5.4.2 Express mathematical relationships using simple equations and inequalities (>, <, =, ≠) Ex. **4 x 5 ____ 8 x 2 +3**	Arrays and Shares Investigation 2: Sessions 2 – 6 Landmarks in the Thousands Investigation 2: Sessions 2 – 4 Changes Over Time Investigation 1: Sessions 5 – 6
A.5.4.3 Use a variable to represent an unknown quantity in a number sentence involving contextual situations and find the value **Ex. Susie bought 48 pencils. If the pencils came in packages of 12, how many packages of pencils did she buy?** **P = 48 ÷ 12**	Can be developed from: Changes Over Time Investigation 1: Sessions 5 – 6

Arkansas Mathematics	Investigations in Number, Data, & Space
Algebraic Models and Relationships	
A.6.4.1 Create a chart or table to organize given information and to understand relationships and explain the results **Ex. Troy must read independently for 2 hours a week. If Troy reads 20 minutes a day, how long will it take him to read a total of two hours?**	Can be developed from: Arrays and Shares Investigation 2: Sessions 1 – 6

Standard 7: Analysis of Change

Students shall analyze change in various contexts

Arkansas Mathematics	Investigations in Number, Data, & Space
Analyze Change	
A.7.4.1 Identify, describe and generalize relationships in which quantities change proportionally **Ex.** **If a car travels at a rate of 50 mph, how far will it travel in three hours?** **hours | 1 | 2 | 3** **miles | 50 | 100 | 150**	Can be developed from: Changes Over Time Investigation 3: Sessions 1 – 4, 7 – 8

Strand: Geometry

Standard 8: Geometric Properties

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships

Arkansas Mathematics	Investigations in Number, Data, & Space
Characteristics and Properties-Three Dimensional	
G.8.4.1 Identify, describe and classify 3-D solids by properties including the number of vertices, edges, and shapes of faces using models	Seeing Solids and Silhouettes Investigation 1: Sessions 1 – 2 Investigation 2: Sessions 1 – 5

Arkansas Mathematics	Investigations in Number, Data, & Space
Characteristics and Properties- Two Dimensional	
G.8.4.2 Identify regular and irregular polygons including octagon	Sunken Ships and Grid Patterns Investigation 2: Sessions 1 – 4
Characteristics and Properties—One Dimensional	
G.8.4.3 Identify, draw, and describe a line, line segment, a ray, an angle, intersecting, perpendicular, and parallel lines	Sunken Ships and Grid Patterns Investigation 1: Sessions 1 – 6 Investigation 2: Sessions 2 - 7
Geometric Relationships	
G.8.4.4 Identify and describe intersecting, perpendicular and parallel lines in problem solving context	Sunken Ships and Grid Patterns Investigation 2: Sessions 1 – 7
G.8.4.5 Classify angles relative to 90° as more than, less than or equal to	Sunken Ships and Grid Patterns Investigation 1: Sessions 3 – 4 Investigation 2: Sessions 1 – 9

Standard 9: Transformation of Shapes

Students shall apply transformations and the use of symmetry to analyze mathematical situations

Arkansas Mathematics	Investigations in Number, Data, & Space
Symmetry and Transformations	
G.9.4.1 Determine the result of a transformation of a two-dimensional figure as a slide (translation), flip (reflection) or turn (rotation) and justify the answer	Mathematical Thinking at Grade 4 Investigation 4: Sessions 1 – 6 Sunken Ships and Grid Patterns Investigation 2: Sessions 2 – 3

Standard 10: Coordinate Geometry

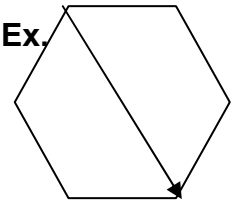
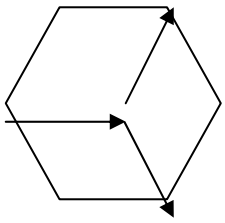
Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems

Arkansas Mathematics	Investigations in Number, Data, & Space
Coordinate Geometry	
G.10.4.1 Locate and identify points on a coordinate grid and name the ordered pair (quadrant one only) using common language and geometric vocabulary (horizontal and vertical)	Sunken Ships and Grid Patterns Investigation 1: Sessions 1 – 6 Investigation 2: Sessions 1 – 3

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling

Arkansas Mathematics	Investigations in Number, Data, & Space
Spatial Visualization and Models	
G.11.4.1 Construct a three-dimensional model composed of cubes when given an illustration	Seeing Solids and Silhouettes Investigation 1: Sessions 1 – 10 Investigation 3: Sessions 1 – 3 Investigation 4: Sessions 1 – 4

Arkansas Mathematics	Investigations in Number, Data, & Space
G.11.4.2 **Create new figures by combining and subdividing models of existing figures in multiple ways and record results in a table** **Ex.**  	Mathematical Thinking at Grade 4 Investigation 4: Sessions 3 – 6 Sunken Ships and Grid Patterns Investigation 2: Sessions 8 – 9

Strand: Measurement

Standard 12: Physical Attributes

Students shall use attributes of measurement to describe and compare mathematical and real-world objects

Arkansas Mathematics	Investigations in Number, Data, & Space
Time: Clock	
M.12.4.1 Recognize that 60 seconds equals 1 minute	Can be developed from: Changes Over Time Investigation 1: Sessions 1 – 2 Investigation 2: Sessions 1 – 2

Arkansas Mathematics	Investigations in Number, Data, & Space
Temperature	
M.12.4.2 Distinguish the temperature in contextual problems using the Fahrenheit scale on a thermometer	Can be developed from: Grade 3 Up and Down the Number Line Investigation 1: Sessions 1 – 2, 8
Tools and Attributes	
M.12.4.3 Use the relationship among units of measurement **<u>Length</u>:** **12 in = 1 ft** **3 ft = 1 yd** **36 in = 1 yd** **100 cm = 1 m** **<u>Capacity</u>:** **2 cups = 1 pint** **2 pints = 1 quart** **4 quarts = 1 gallon** **<u>Weight</u>:** **16 ounces = 1 lb**	The Shape of the Data Investigation 2: Sessions 1 – 3 Money, Miles, and Large Numbers Investigation 2: Sessions 1 – 3 Changes Over Time Unit Preparation: Session 3
M.12.4.4 Create and complete a conversion table to show relationships between units of measurement in the same system	Can be developed from: The Shape of the Data Investigation 2: Sessions 1 – 3 Money, Miles, and Large Numbers Investigation 2: Sessions 1 – 3 Changes Over Time Unit Preparation: Session 3

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement

Arkansas Mathematics	Investigations in Number, Data, & Space
Calendar	
M.13.4.1 Using a calendar to determine elapsed time from month to month	Grade 3 Combining and Comparing Investigation 5: Sessions 1 – 3
Clock	
M.13.4.2 Solve problems involving conversions between minutes and hours	Can be developed from: Changes Over Time Investigation 1: Sessions 1 – 2 Investigation 2: Sessions 1 – 2
M.13.4.3 Restate the time in multiple ways given an analog clock to the nearest 1-minute	Can be developed from: Changes Over Time Investigation 1: Sessions 1 – 2 Investigation 2: Sessions 1 – 2
Elapsed Time	
M.13.4.4 Determine elapsed time in contextual situations to five-minute intervals with beginning time unknown **Ex.** **Mary watched a movie for 1 hour and 15 minutes. The movie ended at 8:15. When did the movie begin?**	Can be developed from: Changes Over Time Investigation 1: Sessions 1 – 2 Investigation 2: Sessions 1 – 2
Money	
M.13.4.5 Apply money concepts in contextual situations **Ex.** • **determine the better buy** • **determine change back with the least amount of currency** • **compare money**	Mathematical Thinking at Grade 4 Investigation 2: Sessions 1 – 4 Money, Miles, and Large Numbers Investigation 1: Sessions 1 – 8

Arkansas Mathematics	Investigations in Number, Data, & Space
Temperature	
M.13.4.6 Read temperatures on Fahrenheit and Celsius scales	Can be developed from: Grade 3 Up and Down the Number Line Investigation 1: Sessions 1 – 2, 8
Applications	
M.13.4.7 Use appropriate customary and metric measurement tools for length, capacity and mass	The Shape of the Data Investigation 2: Sessions 1 – 3 Money, Miles, and Large Numbers Investigation 2: Sessions 1 – 3 Changes Over Time Unit Preparation: Session 3
M.13.4.8 Estimate and measure length, capacity/volume and mass using appropriate customary and metric units **Length: 1/2 inch, 1 cm** **Perimeter: inches, feet, centimeters, meters** **Area: square inches, square feet, square centimeters, square meters** **Weight: pounds/ounces** **Mass: kilograms/grams** **Capacity: cups, pints, quarts, gallons** **Volume: liters**	The Shape of the Data Investigation 2: Sessions 1 – 3 Money, Miles, and Large Numbers Investigation 2: Sessions 1 – 3 Changes Over Time Unit Preparation: Session 3
Perimeter	
M.13.4.9 Use strategies for finding the perimeter of a rectangle	Sunken Ships and Grid Patterns Ten-Minute Math: Lengths and Perimeters
Area	
M.13.4.10 Use strategies for finding the area of a rectangle	Grade 3 Flips, Turns, and Area Investigation 1: Sessions 4 – 5 Investigation 2: Sessions 1 – 5

Arkansas Mathematics	Investigations in Number, Data, & Space
Applications	
M.13.4.11 Use strategies to find the volume (cubic units) of rectangular prisms and cubes	Grade 3 Exploring Solids and Boxes Investigation 4: Sessions 1 – 3

Strand: Data Analysis and Probability

Standard 14: Data Representation

Students shall formulate questions that can be addressed with data and collect, organize and display relevant data to answer them

Arkansas Mathematics	Investigations in Number, Data, & Space
Collect, Organize and Display Data	
DAP.14.4.1 Create a data collection plan after being given a topic and collect, organize, display, describe and interpret simple data using frequency tables or line plots, pictographs and bar graphs	Mathematical Thinking at Grade 4 Ten-Minute Math: Exploring Data The Shape of Data Investigation 1: Sessions 1 – 3 Investigation 2: Sessions 1 – 7 Investigation 3: Sessions 1 – 5 Three Out of Four Like Spaghetti Investigation 2: Sessions 1 – 7

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data

Arkansas Mathematics	Investigations in Number, Data, & Space
Data Analysis	
DAP.15.4.1 Represent and interpret data using pictographs, bar graphs and line graphs in which symbols or intervals are greater than one	Mathematical Thinking at Grade 4 Ten-Minute Math: Exploring Data The Shape of Data Investigation 1: Sessions 1 -3 Investigation 2: Sessions 1 – 4 Investigation 3: Sessions 1 – 5 Changes Over Time Investigation 1: Sessions 1 – 4 Investigation 3: Sessions 1 – 8 Three Out of Four Like Spaghetti Investigation 2: Sessions 1 – 7
DAP.15.4.2 Match a set of data with a graphical representation of the data	Mathematical Thinking at Grade 4 Ten-Minute Math: Exploring Data The Shape of Data Investigation 1: Sessions 1 -3 Investigation 2: Sessions 1 – 4 Investigation 3: Sessions 1 – 5 Changes Over Time Investigation 1: Sessions 1 – 4 Investigation 3: Sessions 1 – 8 Three Out of Four Like Spaghetti Investigation 2: Sessions 1 – 7

Standard 16: Inferences and Predictions

Students shall develop and evaluate inferences and predictions that are based on data

Arkansas Mathematics	Investigations in Number, Data, & Space
Data Analysis	
DAP.16.4.1 Make predictions for a given set of data	Mathematical Thinking at Grade 4 Ten-Minute Math: Exploring Data The Shape of Data Investigation 1: Sessions 1 -3 Investigation 2: Sessions 1 – 4 Investigation 3: Sessions 1 – 5 Changes Over Time Investigation 1: Sessions 1 – 4 Investigation 3: Sessions 1 – 8 Three Out of Four Like Spaghetti Investigation 2: Sessions 1 – 7

Standard 17: Probability

Students shall understand and apply basic concepts of probability

Arkansas Mathematics	Investigations in Number, Data, & Space
Probability	
DAP.17.4.1 Use fractions to predict probability of an event **Ex. There are 5 blue tiles, 3 red tiles, and 2 green tiles What is the probability of pulling out a green tile?**	Landmarks in the Thousands Ten-Minute Math: What is Likely? Money, Miles, and Large Numbers Ten-Minute Math: What is Likely? Three Out of Four Like Spaghetti Investigation 1: Session 3 Investigation 2: Session 2 Ten-Minute Math: What is Likely?

Arkansas Mathematics	Investigations in Number, Data, & Space
DAP.17.4.2 Conduct simple probability experiments, record the data and draw conclusions about the likelihood of possible outcome (roll number cubes, pull tiles from a bag, spin spinner, or determine the fairness of the game)	Landmarks in the Thousands Ten-Minute Math: What is Likely? Money, Miles, and Large Numbers Ten-Minute Math: What is Likely? Three Out of Four Like Spaghetti Investigation 1: Session 3 Investigation 2: Session 2 Ten-Minute Math: What is Likely?
DAP.17.4.3 Find all possible combinations of 2 or 3 sets of objects	Landmarks in the Thousands Ten-Minute Math: What is Likely? Money, Miles, and Large Numbers Ten-Minute Math: What is Likely? Three Out of Four Like Spaghetti Investigation 1: Session 3 Investigation 2: Session 2 Ten-Minute Math: What is Likely?

Investigations in Number, Data, & Space
to the
Arkansas Mathematics Curriculum Framework

Grade Five

Strand: Number and Operations

Standard 1 Number Sense:

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems

Arkansas Mathematics	Investigations in Number, Data, & Space
Rational Numbers	
NO.1.5.1 Use models and visual representations to develop the concepts of the following: **<u>Fractions</u>:** • **parts of unit wholes** • **parts of a collection** • **locations on number lines** • **locations on ruler (benchmark fractions)** • **divisions of whole numbers** **<u>Ratios</u>:** • **part-to-part (2 boys to 3 girls)** • **part-to-whole (2 boys to 5 people)** **<u>Percents</u>:** • **part-to-100**	Fractions: Name That Portion Investigation 2: Sessions 1 – 8 Data: Kids, Cats and Ads Investigation 4: Session 1 Ratios: Name That Portion Investigation 1: Session 2 Percents: Name That Portion Investigation 1: Sessions 3 – 6 Investigation 4: Sessions 2 – 4
NO.1.5.2 Develop understanding of decimal place value using models	Name That Portion Investigation 3: Sessions 1 – 6

Arkansas Mathematics	Investigations in Number, Data, & Space
NO.1.5.3 Identify decimal and percent equivalents for benchmark fractions	Name That Portion Investigation 1: Sessions 1, 3 – 7 Investigation 3: Sessions 1, 5 – 8 Investigation 4: Sessions 3 – 4 Data: Kids, Cats and Ads Investigation 3: Sessions 1
NO.1.5.4 Round and compare decimals to a given place value (whole number, tenths, hundredths)	Can be developed from: Name That Portion Investigation 3: Sessions 1 – 6
NO.1.5.5 Use models of benchmark fractions and their equivalent forms: • **to analyze the size of fractions** • **to determine that simplification does not change the value of the fraction** • **to convert between mixed numbers and improper fractions**	Name That Portion Investigation 2: Sessions 1 – 9 Data: Kids, Cats and Ads Investigation 4: Session 1
NO.1.5.6 Use models to differentiate between perfect squares up to 100 and other numbers	Mathematical Thinking at Grade 5 Investigation 1: Sessions 1 – 6

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another

Arkansas Mathematics	Investigations in Number, Data, & Space
Number Theory	
NO.2.5.1 Use divisibility rules to determine if a number is a factor of another number (2, 3, 5, 10)	Mathematical Thinking at Grade 5 Investigation 3: Sessions 2 – 4
NO.2.5.2 Identify commutative and associative properties	Mathematical Thinking at Grade 5 Investigation 1: Sessions 1 – 6 Investigation 2: Sessions 1 – 4 Building on Numbers You Know Investigation 1: Sessions 2 – 5, 8 Investigation 2: Sessions 1 – 6 Investigation 3: Sessions 1 – 6
NO.2.5.3 Identify the distributive property by using physical models to solve computation and real world problems	Building on Numbers You Know Investigation 2: Sessions 5 – 7 Investigation 3: Sessions 1 – 10
NO.2.5.4 Apply rules (conventions) for order of operations to whole numbers where the left to right computations are modified only by the use of parentheses	Can be developed from: Mathematical Thinking at Grade 5 Investigation 3: Sessions 2 – 4 Building on Numbers You Know Investigation 2: Sessions 1 – 2, 5 – 7 Investigation 3: Sessions 7 – 10 Investigation 5: Sessions 1 – 7
Understand Operations	
NO.2.5.5 Model addition, subtraction, and multiplication of fractions with like and unlike denominators and decimals	Name That Portion Investigation 2: Sessions 1 – 9 Investigation 3: Sessions 7 – 8

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates

Arkansas Mathematics	Investigations in Number, Data, & Space
Computational Fluency	
NO.3.5.1 Develop and use a variety of algorithms with computational fluency to perform whole number operations using addition and subtraction (up to 5 digit numbers), multiplication (up to 3-digit x 2 digit), division (up to 2-digit divisor) interpreting remainders, including real world problems	Mathematical Thinking at Grade 5 Investigation 3: Sessions 3 – 5 Investigation 4: Session 1 Building on Numbers You Know Investigation 1: Sessions 1 – 8 Investigation 2: Sessions 1 – 7 Investigation 3: Sessions 1 – 10 Investigation 5: Sessions 1 – 7
NO.3.5.2 Develop and use algorithms: • **to add and subtract numbers containing decimals (up to thousandths place)** • **to multiply decimals (hundredths x tenths)** • **to divide decimals by whole number divisors** • **to add and subtract fractions with like denominators**	Name That Portion Investigation 2: Sessions 1 – 9 Investigation 3: Sessions 1 - 8
NO.3.5.3 Solve, with and without appropriate technology, two-step problems using a variety of methods and tools (i.e. objects, mental computation, paper and pencil)	Building on Numbers You Know Investigation 2: Session 7 Investigation 3: Sessions 7 – 10 Investigation 5: Sessions 3 – 7
Estimation	
NO.3.5.4 Develop and use strategies to Estimate the results of whole number computations and to judge the reasonableness of such results	Building on Numbers You Know Investigation 3: Sessions 1 – 6 Investigation 5: Sessions 1 – 2

Arkansas Mathematics	Investigations in Number, Data, & Space
Application Computation	
NO.3.5.5 Use factors of numbers: • **to introduce exponents (Ex: 36= 6 x 6 or 6^2)** • **to find common factors of two numbers** • **to simplify fractions to the lowest terms**	Mathematical Thinking at Grade 5 Investigation 1: Sessions 1 – 6 Investigation 2: Sessions 1 – 4 Investigation 3: Sessions 1, 5 Name That Portion Investigation 2: Sessions 1 – 2

Strand: Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions

Arkansas Mathematics	Investigations in Number, Data, & Space
Patterns, Relations and Functions	
A.4.5.1 Solve problems by finding the next term or missing term in a pattern or function table using real world situations	Mathematical Thinking at Grade 5 Investigation 2: Session 1 Name That Portion Investigation 1: Session 2 Measurement Benchmarks Investigation 3: Session 3 Patterns of Change Investigation 1: Sessions 1 – 4
A.4.5.2 Interpret and write a rule for a one-operation function table (Ex: adding 3)	Measurement Benchmarks Investigation 3: Session 3 Patterns of Change Investigation 1: Sessions 1 – 4

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols

Arkansas Mathematics	Investigations in Number, Data, & Space
Expressions, Equations and Inequalities	
A.5.5.1 Model and solve simple equations by informal methods using manipulatives and appropriate technology	Name That Portion Investigation 3: Session 8 Building on Numbers You Know Investigation 1: Sessions 3 – 4 Investigation 2: Sessions 5 – 7 Investigation 3: Session 10 Investigation 5: Sessions 1 – 7
A.5.5.2 Write expressions containing one variable (a letter representing an unknown quantity) using rules for addition and subtraction	Can be developed from Name That Portion Investigation 3: Session 8 Building on Numbers You Know Investigation 1: Sessions 3 – 4 Investigation 2: Sessions 5 – 7 Investigation 3: Session 10 Investigation 5: Sessions 1 – 7
A.5.5.3 Select, write and evaluate algebraic expressions with one variable by substitution (Ex: Evaluate x+4 if x=7)	Can be developed from: Name That Portion Investigation 3: Session 8 Building on Numbers You Know Investigation 1: Sessions 3 – 4 Investigation 2: Sessions 5 – 7 Investigation 3: Session 10 Investigation 5: Sessions 1 – 7

Standard 6: Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships

Arkansas Mathematics	Investigations in Number, Data, & Space
Algebraic Models and Relationships	
A.6.5.1 Draw conclusions and make predictions, with and without appropriate technology, from models, tables and line graphs	Name That Portion Investigation 4: Sessions 2 – 7 Between Never and Always Investigation 1: Sessions 5 – 7 Patterns of Change Investigation 2: Sessions 1 – 5 Investigation 3: Sessions 1 – 7 Data: Kids, Cats and Ads Investigation 5: Sessions 3 – 5

Standard 7: Analysis of Change

Students shall analyze change in various contexts

Arkansas Mathematics	Investigations in Number, Data, & Space
Analyze Change	
A.7.5.1 Model and describe quantities that change using real world situations (Ex. age and height)	Patterns of Change Investigation 2: Sessions 1 – 5 Investigation 3: Sessions 1 – 7

Strand: Geometry

Standard 8: Geometric Properties

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships

Arkansas Mathematics	Investigations in Number, Data, & Space
Characteristics of Geometric Shapes	
G.8.5.1 Identify and model regular and irregular polygons including decagon	Picturing Polygons Investigation 1: Sessions 1 – 4 Investigation 2: Sessions 1 – 5 Investigation 3: Sessions 1 – 2
G.8.5.2 Identify and draw congruent, adjacent, obtuse, acute, right and straight angles (Label parts of an angle: vertex, rays, interior and exterior)	Picturing Polygons Investigation 2: Sessions 6 – 9 Investigation 3: Session 3
G.8.5.3 Model and identify circle, radius, diameter, center, circumference and chord	Can be developed from: Name That Portion Investigation 2: Sessions 1 – 2 Investigation 4: Session 2
G.8.5.4 Model and identify the properties of congruent figures	Can be developed from: Picturing Polygons Investigation 2: Sessions 1 – 7

Standard 9: Transformation of Shapes

Students shall apply transformations and the use of symmetry to analyze mathematical situations

Arkansas Mathematics	Investigations in Number, Data, & Space
Symmetry and Transformations	
G.9.5.1 Predict and describe the results of translation (slide), reflection (flip), rotation (turn), showing that the transformed shape remains unchanged	Picturing Polygons Investigation 1: Session 4 Investigation 3: Sessions 4 – 6

Standard 10: Coordinate Geometry

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems

Arkansas Mathematics	Investigations in Number, Data, & Space
Coordinate Geometry	
G.10.5.1 Use geometric vocabulary (horizontal/x-axis, vertical/ y-axis, ordered pairs) to describe the location and plot points in Quadrant I	Picturing Polygons Investigation 3: Sessions 3 – 4

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling

Arkansas Mathematics	Investigations in Number, Data, & Space
Spatial Visualization and Models	
G.11.5.1 Using grid paper, draw and identify two-dimensional patterns (nets) for cubes	Picturing Polygons Investigation 1: Sessions 3 – 4 Investigation 2: Sessions 4 – 5

Strand: Measurement

Standard 12: Physical Attributes

Students shall use attributes of measurement to describe and compare mathematical and real-world objects

Arkansas Mathematics	Investigations in Number, Data, & Space
Attributes and Tools	
M.12.5.1 Identify and select appropriate units and tools to measure (Ex. angles with degrees, distance with feet)	Measurement Benchmarks Investigation 1: Sessions 1 – 8 Investigation 2: Session 1 – 4
M.12.5.2 Make conversions within the customary measurement system in real world problems (Ex. hours to minutes, feet to inches, quarts to gallons, etc)	Measurement Benchmarks Investigation 1: Sessions 1 – 8 Investigation 2: Sessions 1 – 4
M.12.5.3 Establish through experience benchmark prefixes of mili-, centi-, and kilo-	Measurement Benchmarks Investigation 1: Sessions 1 – 8 Investigation 2: Sessions 1 – 4

Arkansas Mathematics	Investigations in Number, Data, & Space
M.12.5.4 Understand when to use linear units to describe perimeter, square units to describe area or surface area, and cubic units to describe volume, in real world situations	Measurement Benchmarks Investigation 1: Sessions 1 – 4 Container and Cubes Investigation 1: Sessions 1 – 2 Investigation 2: Sessions 1 – 5 Investigation 3: Sessions 1 – 4 Investigation 4: Sessions 1 – 5
M.12.5.5 Model the differences between covering the faces (surface area/nets) and filling the interior (volume of cubes)	Containers and Cubes Investigation 1: Session 1 – 2 Investigation 2: Sessions 1 – 5 Investigation 3: Sessions 1 – 4 Investigation 4: Sessions 1 – 5 Data: Kids, Cats, and Ads Ten-Minute Math: Volume and Surface Area

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement

Arkansas Mathematics	Investigations in Number, Data, & Space
Attributes and Tools	
M.13.5.1 Solve real world problems involving one elapsed time, counting forward (calendar and clock)	Measurement Benchmarks Investigation 3: Sessions 1 – 3
M.13.5.2 Determine which unit of measure or measurement tool matches the context for a problem situation	Measurement Benchmarks Investigation 1: Sessions 1 – 8 Investigation 2: Sessions 1 – 8
M.13.5.3 Draw and measure distance to the nearest cm and ¼ inch accurately	Measurement Benchmarks Investigation 1: Session 3

Arkansas Mathematics	Investigations in Number, Data, & Space
M.13.5.4 Develop and use strategies to solve real world problems involving perimeter and area of rectangles	Measurement Benchmarks Investigation 1: Sessions 5 – 8
M.13.5.5 Count the distance between two points on a horizontal or vertical line and compare the lengths of the paths on a grid (Ex. shortest path, paths of equal length, etc)	Grade 4 Sunken Ships and Grid Patterns Investigation 1: Sessions 1 – 6
M.13.5.6 Use benchmark angles (Ex. 45 degrees, 90 degrees, 120 degrees, 180 degrees) to estimate the measure of angles	Picturing Polygons Investigation 2: Sessions 6 – 9

Strand: Data Analysis and Probability

Standard 14: Data Representation

Students shall formulate questions that can be addressed with data and collect, organize and display relevant data to answer them

Arkansas Mathematics	Investigations in Number, Data, & Space
Collect, Organize and Display Data	
DAP.14.5.1 Develop appropriate questions for surveys	Name That Portion Investigation 4: Sessions 1, 5 – 6 Data: Kids, Cats, and Ads Investigation 2: Session 2 Investigation 3: Sessions 2 – 4 Investigation 4: Sessions 2 – 3 Investigation 5: Sessions 1 – 5

Arkansas Mathematics	Investigations in Number, Data, & Space
DAP.14.5.2 Collect numerical and categorical data using surveys, observations and experiments that would result in bar graphs, line graphs, line plots and stem-and-leaf plots	Name That Portion Investigation4: Sessions 1 – 7 Measurement Benchmarks Investigation 2: Sessions 7 – 8 Data: Kids, Cats, and Ads Investigation 1: Sessions 1 – 3 Investigation 2: Sessions 1 – 3 Investigation 3: Sessions 2 – 4 Investigation 4: Sessions 2 – 3 Investigation 5: Sessions 1 – 5
DAP.14.5.3 Construct and interpret frequency tables, charts, line plots, stem-and-leaf plots and bar graphs	Name That Portion Investigation4: Sessions 1 – 7 Measurement Benchmarks Investigation 2: Sessions 7 – 8 Data: Kids, Cats, and Ads Investigation 1: Sessions 1 – 3 Investigation 2: Sessions 1 – 3 Investigation 3: Sessions 2 – 4 Investigation 4: Sessions 2 – 3 Investigation 5: Sessions 1 – 5

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data

Arkansas Mathematics	Investigations in Number, Data, & Space
Data Analysis	
DAP.15.5.1 Interpret graphs such as line graphs, double bar graphs, and circle graphs	Name That Portion Investigation4: Sessions 1 – 7 Measurement Benchmarks Investigation 2: Sessions 7 – 8 Data: Kids, Cats, and Ads Investigation 1: Sessions 1 – 3 Investigation 2: Sessions 1 – 3 Investigation 3: Sessions 2 – 4 Investigation 4: Sessions 2 – 3 Investigation 5: Sessions 1 – 5

Arkansas Mathematics	Investigations in Number, Data, & Space
DAP.15.5.2 Determine, with and without appropriate technology, the range, mean, median and mode (whole number data sets) and explain what each indicates about the set of data	Data: Kids, Cats and Ads Investigation 1: Sessions 2 – 4

Standard 16: Inferences and Predictions

Students shall develop and evaluate inferences and predictions that are based on data

Arkansas Mathematics	Investigations in Number, Data, & Space
Data Analysis	
DAP.16.5.1 Make predictions and justify conclusions based on data	Name That Portion Investigation4: Sessions 1 – 7 Measurement Benchmarks Investigation 2: Sessions 7 – 8 Data: Kids, Cats, and Ads Investigation 1: Sessions 1 – 3 Investigation 2: Sessions 1 – 3 Investigation 3: Sessions 2 – 4 Investigation 4: Sessions 2 – 3 Investigation 5: Sessions 1 – 5

Standard 17: Probability

Students shall understand and apply basic concepts of probability

Arkansas Mathematics	Investigations in Number, Data, & Space
Data Analysis	
DAP.17.5.1 Identify and predict the probability of events within a simple experiment	Between Never and Always Investigation 1: Sessions 1 – 7 Investigation 2: Sessions 1 – 5
DAP.17.5.2 List and explain all possible outcomes in a given situation	Between Never and Always Investigation 1: Sessions 1 – 7 Investigation 2: Sessions 1 – 5