A Correlation of

to the

Louisiana Department of Education

Mathematics—Grade Level Expectations

Grades K - 5

C/M-92

Introduction

This document demonstrates how ***Investigations in Number, Data, and Space®*** supports the Louisiana Mathematics Grade Level Expectations. 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® is a Kindergarten through Grade 5 curriculum. ***Investigations*** 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*** offers 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

Book Title: Investigations in Number, Data, & Space **Grade Level:** Kindergarten

Publisher: Pearson Scott Foresman **Subject/Course:** Mathematics

Kindergarten

Number and Number Relations

In problem-solving investigations, students demonstrate an understanding of the real number system and communicate the relationships within that system using a variety of techniques and tools.

Students use estimation, mental arithmetic, number lines, graphs, appropriate models, manipulatives, calculators, and computers as they investigate problems involving whole numbers.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
1. Count by ones to 20 (N-1-E) (N-3-E)	Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Investigations 2, 3, 4 Collecting, Counting, and Measuring Investigations 1, 2, 4, 5, 6 Counting Ourselves and Others Investigations 1, 3, 4
2. Count a set of 20 or fewer objects by establishing a 1-to-1 correspondence between number names and objects (N-1-E) (N-3-E) (A-1-E)	Mathematical Thinking in Kindergarten Investigations 1, 2, 3 Patterns, Trains, and Hopscotch Paths Investigation 4: Choice Time: 12 Chips; Choice Time: Staircase Patterns Collecting, Counting, and Measuring Investigations 1, 2, 3, 4, 5 Counting Ourselves and Others Investigations 1, 3, 4 How Many in All? Investigations 1, 2, 3, 4 Classroom Routines: Attendance, The Counting Jar, Calendar
3. Use the ordinal numerals 1st through 10th to discuss positions in ordered lists (N-1-E)	Mathematical Thinking in Kindergarten Investigation 3: Focus Time: Calendar

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
4. Identify the numerals for the numbers 0 through 20 (N-1-E) (N-3-E)	Mathematical Thinking in Kindergarten Investigations 2, 3, 4 Counting Ourselves and Others Investigation 1 How Many in All? Investigation 2 Investigation 3: Choice Time: Counters in a Cup Investigation 4: Choice Time: Six Crayons in All Collecting, Counting, and Measuring Investigation 1 Investigation 2: Focus Time: Taking Inventory
5. Using a number line or chart, identify the numbers coming before/after a given number and between 2 given numbers (N-1-E) (N-3-E) (A-1-E)	Number lines can be introduced during any of these activities. All curriculum units: Classroom Routines: Counting Jar; Calendar
6. Identify pennies, nickels, and dimes and their values using the cent sign (¢) (N-1-E) (N-2-E) (N-6-E) (M-1-E)	Counting Ourselves and Others Investigation 2: Choice Time: The Grocery Store
7. Count forward and backward from a given number between 1 and 10 (N-3-E)	In these Investigations, students have the opportunity to count up or count back by 1. Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Investigation 2 Patterns, Trains, and Hopscotch Paths Investigation 4: Choice Time: Staircase Patterns Collecting, Counting, and Measuring Investigations 1, 4 How Many In All? Investigation 1: Choice Time: Collect 15 Together Classroom Routines: Counting Jar *See also, Grade 1.*

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
8. Compare sets containing 20 or fewer objects using the words *same/different* and *more/less/greater/fewer* (N-3-E) (N-1-E)	Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Investigations 2, 3, 4 Patterns, Trains, and Hopscotch Paths Investigation 4: Choice Time: 12 Chips; Choice Time: Staircase Patterns Counting Ourselves and Others Investigations 3, 4 How Many In All? Investigation 2: Choice Time: Grab Two Handfuls Investigation 3: Choice Time: Double Compare Investigation 4: Focus Time: Blue and Red Crayons Collecting, Counting, and Measuring Investigations 3, 4, 5, 6
9. Use concrete objects to model simple real-life addition and subtraction problems (N-4-E)	How Many in All? Investigation 1: Choice Time: Collect 15 Together, Inventory Bags Investigations 2, 3, 4 Counting Ourselves and Others Investigation 4 Collecting, Counting, and Measuring Investigation 4: Choice Time: Collect 10 Together Investigation 5: Choice Time: Racing Bears Investigation 6
10. Use operational vocabulary (*add, subtract, join, remove, take away, put together*) to explore sets of objects (N-5-E)	How Many in All? Investigation 3: Focus Time: Story Problems Investigation 4: Ongoing Story Problems investigation

Algebra

In problem-solving investigations students demonstrate an understanding of concepts and processes that allow them to analyze, represent, and describe relationships among variable quantities and to apply algebraic methods to real-world situations.

Students use manipulatives, models, graphs, tables, technology, number sense, and estimation as they investigate problems involving the concepts and application of algebra.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
11. Use the words *same, different, equal, not equal, greater than,* and *less than* while using concrete objects for comparative models (A-1-E)	These activities provide opportunities for students to use this specific vocabulary. Mathematical Thinking in Kindergarten Investigation 1: Focus Time: Attendance Investigations 2, 3, 4 Patterns, Trains, and Hopscotch Paths Investigation 4: Choice Time: 12 Chips; Choice Time: Staircase Patterns Counting Ourselves and Others Investigations 3, 4 How Many In All? Investigation 2: Choice Time: Grab Two Handfuls Investigation 3: Choice Time: Double Compare Investigation 4: Focus Time: Blue and Red Crayons Collecting, Counting, and Measuring Investigations 3, 4, 5, 6
12. Model and act out story problems, physically or with objects, to solve whole number sentences with sums less than or equal to 6 (A-2-E)	How Many in All? Investigation 3: Focus Time: Story Problems Investigation 4: Ongoing Story Problems investigation

Measurement

In problem-solving investigations, students demonstrate an understanding of the concepts, processes, and real-life applications of measurement.

Students use number sense, estimation, appropriate manipulatives, tools, and technology as they investigate problems involving measurement.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
13. Use vocabulary such as: *yesterday, today, tomorrow, hours, weeks*, names of days, names of months; sequence events; and identify calendars and clocks as objects that measure time (M-1-E) (M-2-E) (M-5-E)	Mathematical Thinking in Kindergarten Investigation 3: Focus Time: Calendar Classroom Routines: Calendar
14. Measure and estimate length and capacity using non-standard units (e.g., sticks, paper clips, blocks, beans) (M-2-E) (M-3-E)	How Many in All? Investigation 1 Collecting, Counting and Measuring Investigation 3
15. Use comparative and superlative vocabulary in measurement settings (e.g., *longest, shortest, most, hottest, heaviest, biggest*) (M-3-E) (M-1-E) (M-2-E)	Patterns, Trains and Hopscotch Paths Investigation 1: Focus Time: Cubes What Do You Notice? How Many in All? Investigation 1 Investigation 2: Choice Time: Towers of Six Collecting, Counting and Measuring Investigations 3, 4, 5 Making Shapes and Building Blocks: Investigations 4, 5

Geometry

In problem-solving investigations, students demonstrate an understanding of geometric concepts and applications involving one-, two-, and three-dimensional geometry, and justify their findings.

Students use number sense, estimation, models, drawings, manipulatives, and technology as they investigate problems involving geometric concepts.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
16. Name and identify basic shapes using concrete models (e.g., circles, squares, triangles, rectangles, rhombuses, balls, boxes, cans, cones) (G-2-E) (G-1-E) (G-4-E) (G-5-E)	Mathematical Thinking in Kindergarten Investigation 1: Choice Time: Exploring Pattern Blocks, Exploring Geoblocks Making Shapes and Building Blocks Investigations 1, 2, 3, 4, 5
17. Compare, contrast, and sort objects or shapes according to two attributes (e.g., shape and size, shape and color, thickness and color) (G-2-E)	Mathematical Thinking in Kindergarten Investigation 1: Choice Time: Exploring Pattern Blocks, Exploring Geoblocks Making Shapes and Building Blocks Investigations 1, 2, 3, 4, 5
18. Use words that indicate direction and position of objects and arrange an object in a specified position and orientation (e.g., between, behind, above) (G-3-E)	Patterns, Trains, and Hopscotch Paths Investigation 4: Choice Time: Staircase Patterns Making Shapes and Building Blocks Investigations 2. 3, 4
19. Investigate the results of combining shapes (using paper shapes, pattern blocks, tangrams, etc.) (G-3-E) (G-1-E)	Making Shapes and Building Blocks Investigation 1: Choice Time: Pattern Block Pictures Investigation 2: Choice Time: Pattern Block Puzzles Investigation 3: Choice Time: Shape of Things on the Computer Investigation 4: Choice Time: Build a Block
20. Draw circles, squares, rectangles, and triangles (G-4-E)	Making Shapes and Building Blocks Investigation 1

Data Analysis, Probability, and Discrete Math

In problem-solving investigations, students discover trends, formulate conjectures regarding cause-and-effect relationships, and demonstrate critical thinking skills in order to make informed decisions.

Students use collection and organizational techniques, number sense, estimation, manipulatives, and technology as they investigate problems involving data.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
21. Collect and organize concrete data using tally mark charts (D-1-E)	Counting Ourselves and Others Investigation 1: Choice Time: Counting Chairs Investigation 3
22. Collect and organize data in a simple bar graph using pictures or objects (D-1-E) (D-2-E)	Counting Ourselves and Others Investigation 2: Focus Time: What Did You Eat for Lunch? Investigation 3 *See also, Teacher Note, page 54*.
23. Sort, represent, and use information in simple tables and bar/picture graphs (D-2-E) (D-3-E)	Counting Ourselves and Others Investigation 2: Focus Time: What Did You Eat for Lunch?; Choice Time: Boxes, Bottles, and Cans; Clothing Sort Investigation 3

Patterns, Relations, and Functions

In problem-solving investigations, students demonstrate an understanding of patterns, relations, and functions that represent and explain real-world situations.

Students use number sense, estimation, manipulatives, drawings, tables, graphs, formulas, and technology as they investigate problems involving patterns, relations, and functions.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
24. Recognize, copy, name, create, and extend repeating patterns (e.g., ABAB, AABB, ABBA) using concrete objects, shapes, pictures, numbers, and sounds (P-1-E)	Pattern Trains and Hopscotch Paths Investigations 1–4

Book Title: Investigations in Number, Data, & Space **Grade Level:** One

Publisher: Pearson Scott Foresman **Subject/Course:** Mathematics

Grade 1

Number and Number Relations

In problem-solving investigations, students demonstrate an understanding of the real number system and communicate the relationships within that system using a variety of techniques and tools.

Students use estimation, mental arithmetic, number lines, graphs, appropriate models, manipulatives, calculators, and computers as they investigate problems involving whole numbers.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
1. Count to 100 by 1s, 5s, 10s, and 25s (N-1-E) (N-3-E) (N-4-E)	Mathematical Thinking at Grade 1 Investigation 1: Sessions 2–4 Investigation 2: Sessions 1–6 Investigation 4: Sessions 1–6 Investigation 5: Sessions 1–6 Building Number Sense Investigation 1: Sessions 1–8 Investigation 2: Sessions 1–6, 8–9 Investigation 3: Sessions 1–7, 9 Investigation 4: Sessions 1–10 Number Games and Story Problems Investigation 2: Sessions 1–12 Bigger, Taller, Heavier, Smaller Investigation 2: Sessions 1–7 Classroom Routines: Counting
2. Read and write numerals to 100 (N-1-E)	Mathematical Thinking at Grade 1 Investigation 1: Sessions 2–4 Investigation 2: Sessions 1–6 Investigation 4: Sessions 1–6 Investigation 5: Sessions 1–6 Building Number Sense Investigation 1: Sessions 1–8 Investigation 2: Sessions 1–6, 8–9 Investigation 3: Sessions 1–7, 9 Investigation 4: Sessions 1–10

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
(continued)	Number Games and Story Problems Investigation 2: Sessions 6–12 Bigger, Taller, Heavier, Smaller Investigation 2: Sessions 1–7 Classroom Routines: Counting
3. Write number words for 0 to 19 (N-1-E) (N-3-E)	This expectation can be introduced during these activities. Number cards can be reproduced with number words inserted. Mathematical Thinking at Grade 1 Investigation 2: Sessions 1, 2-3 Building Number Sense Investigation 1: Sessions 1, 3
4. Use ordinal numbers through 31st as they relate to the calendar (N-1-E)	Several activities provide opportunities for practice with ordinal numbers. Notes to the teacher point out these opportunities. Mathematical Thinking at Grade 1 Investigation 2: Sessions 2 and 3 (see p. 37) Building Number Sense Investigation 3: Sessions 1–2
5. Model and read place value in word, standard, and expanded form for numbers through 99 (N-1-E)	These activities provide opportunities to introduce this expectation. Building Number Sense Investigation 3: Sessions 1– 2 Number Games and Story Problems Investigation 2: Sessions 6–9
6. Use region models and sets of objects to demonstrate understanding of the concept of halves (N-1-E)	This expectation is addressed in Shapes, Halves, and Symmetry in Grade 2.
7. Identify quarters, half-dollars, and their values (N-1-E) (N-2-E) (M-1-E)	Number Games and Story Problems Investigation 2: Sessions 3–8
8. Find the value of a set of coins up to $1.00, using one denomination of coin (N-2-E) (N-6-E) (M-1-E) (M-5-E)	Number Games and Story Problems Investigation 2: Sessions 4–5
9. Apply estimation strategies to estimate the size of groups up to 20 (N-2-E) (N-8-E)	Classroom Routines: Counting
10. Using a number line or chart, locate, compare, and order whole numbers less than 100 and identify the numbers coming before/after a given number and between 2 given numbers (N-3-E) (A-1-E)	Building Number Sense Investigation 2: 6–8

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
11. From a given number between 1 and 100, count forward and backward (N-3-E)	Building Number Sense Investigation 4: Sessions 2–5 Number Games and Story Problems Investigation 2: Sessions 6–8 Investigation 3: Sessions 2–5
12. Know the basic facts for addition and subtraction [0s, 1s, counting on and back 2s, doubles, doubles ± 1, then 10s facts, and related turn-around (commutative) pairs] and use them to solve real-life problems (N-4-E) (N-6-E) (N-8-E)	Mathematical Thinking at Grade 1 Investigation 2: Sessions 4–6 Investigation: Session 4 Building Number Sense Investigation 1: Sessions 1–9 Investigation 2: Sessions 1–9 Investigation 4: Sessions 1–10 Number Games and Story Problems Investigation 1: Sessions 1–10 Investigation 2: Sessions 1–8, 10–12 Investigation 3: Sessions 1–8
13. Recognize and apply addition and subtraction as inverse operations (N-4-E)	These activities provide opportunities to introduce this expectation. Number Games and Story Problems Investigation 3: Sessions 1–5 Building Number Sense Teacher Note, page 45.
14. Add and subtract 2-digit numbers using manipulatives (N-4-E) (N-7-E)	Number Games and Story Problems Investigation 2: Session 13
15. Recognize real-life situations as addition or subtraction problems (N-5-E) (N-4-E)	Mathematical Thinking at Grade 1 Investigation 2: Sessions 4–6 Investigation 4: Sessions 4–6 Building Number Sense Investigation 4: Sessions 1–5, 7–10 Quilt Squares and Block Towns Investigation 1: Sessions 2–10 Investigation 3: Sessions 6–7 Number Games and Story Problems Investigation 3: Sessions 1–13
16. Given a number and number line/hundreds chart, identify the nearest ten (N-7-E)	These activities provide the opportunity to introduce this expectation. Number Games and Story Problems Investigation 2: Sessions 6–8

Algebra

In problem-solving investigations students demonstrate an understanding of concepts and processes that allow them to analyze, represent, and describe relationships among variable quantities and to apply algebraic methods to real-world situations.

Students use manipulatives, models, graphs, tables, technology, number sense, and estimation as they investigate problems involving the concepts and application of algebra.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
17. Use the equal sign (=) to express the relationship of equality (A-1-E)	Building Number Sense Investigation 2: Session 2 Investigation 4: Sessions 1–2 Number Games and Story Problems Investigation 1: Sessions 1–10
18. Use objects, pictures, and number sentences to represent real-life problem situations involving addition and subtraction (A-1-E) (A-3-E) (N-7-E)	Mathematical Thinking at Grade 1 Investigation 2: Sessions 4–6 Investigation 4: Sessions 4–6 Building Number Sense Investigation 2: Sessions 1–2, 6–9 Investigation 4: Sessions 1–5, 7–10 Number Games and Story Problems Investigation 1: Sessions 1–10 Investigation 2: Sessions 1–8, 10–13 Investigation 3: Sessions 10, 11, 12
19. Use objects, pictures, and verbal information to solve for missing numbers (A-2-E) (N-7-E)	Number Games and Story Problems Investigation 2: Sessions 6–8 Investigation 3: Sessions 9 Investigation 3: Sessions 1–5, 10–12

Measurement

In problem-solving investigations, students demonstrate an understanding of the concepts, processes, and real-life applications of measurement.

Students use number sense, estimation, appropriate manipulatives, tools, and technology as they investigate problems involving measurement.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
20. Measure length to the nearest inch and centimeter using appropriate tools (M-1-E) (M-2-E)	In these activities, students use interlocking cubes to measure objects. Bigger, Taller, Heavier, Smaller Investigation 3: Sessions 4–5
21. Tell time to the hour and half-hour, and identify date, day, week, month, and year on a calendar (M-1-E) (M-2-E) (M-5-E)	Survey Questions and Secret Rules Investigation 3: Sessions 1–3 Classroom Routines: Counting; Understanding Time and Changes
22. Select appropriate non-standard units for linear measurement situations (e.g., sticks, blocks, paper clips) (M-2-E)	Bigger, Taller, Heavier, Smaller Investigation 3: Sessions 2, 4–5
23. Compare the measure of objects to benchmarks (e.g., the width of a child's thumb is about a centimeter, the weight of a loaf of bread is about a pound, and the mass of a textbook is about a kilogram) (M-2-E)	Bigger, Taller, Heavier, Smaller Investigation 3: Sessions 1–3
24. Measure capacity using cups (M-2-E) (M-3-E) (M-1-E)	These activities involve measuring capacity with non-standard units. Bigger, Taller, Heavier, Smaller Investigation 2: Sessions 1–7
25. Identify the thermometer as a tool for measuring temperature (M-2-E)	These activities provide opportunities to introduce this expectation. Survey Questions and Secret Rules Classroom Routines: Understanding Time and Changes (Weather)

Geometry

In problem-solving investigations, students demonstrate an understanding of geometric concepts and applications involving one-, two-, and three-dimensional geometry, and justify their findings.

Students use number sense, estimation, models, drawings, manipulatives, and technology as they investigate problems involving geometric concepts.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
26. Compare, contrast, name, and describe attributes (e.g., corner, side, straight, curved, number of sides) of shapes using concrete models [circle, rectangle (including square), rhombus, triangle] (G-1-E) (G-2-E) (G-4-E)	Mathematical Thinking at Grade 1 Investigation 1: Sessions 1–4 Quilt Squares and Block Towns Investigation 1: Sessions 1, 11–12 Investigation 2: Sessions 1–2, 4–10 Investigation 3: Sessions 1–5 Bigger, Smaller, Heavier, Taller Investigation 2: Sessions 2–7
27. Connect the informal language used for 3-dimensional shapes to their proper mathematical name (e.g., a ball is a sphere, a box is a rectangular prism, a can is a cylinder) (G-2-E)	Quilt Squares and Block Towns Investigation 1: Session 1 Investigation 2: Sessions 1–10 Investigation 3: Sessions 1–5
28. Determine if a shape has a line of symmetry by folding (G-2-E)	This expectation is addressed in Shapes Halves, and Symmetry in Grade 2.
29. Visualize, predict, and create new shapes by cutting apart and combining existing 2- and 3-dimensional shapes (G-3-E) (G-1-E)	Quilt Squares and Block Towns Investigation 1: Sessions 3–10 Investigation 2: Sessions 7–10 Investigation 3: Sessions 1–5
30. Identify congruent shapes (i.e., same size and shape) in a variety of positions and orientations (G-3-E) (G-2-E)	These activities provide opportunities to introduce this expectation. Quilt Squares and Block Towns Investigation 1: 2-D Shapes and Patterns: Sessions 11-12, 13-15
31. Draw line segments (G-5-E)	See Grade 2, How Long, How Far?

Data Analysis, Probability, and Discrete Math

In problem-solving investigations, students discover trends, formulate conjectures regarding cause-and-effect relationships, and demonstrate critical thinking skills in order to make informed decisions.

Students use collection and organizational techniques, number sense, estimation, manipulatives, and technology as they investigate problems involving data.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
32. Given a set of data, construct and read information from bar graphs and charts (D-1-E) (D-2-E)	Various representations of data are constructed and read in these activities. Mathematical Thinking at Grade 1 Investigation 5: Sessions 2–6 Survey Questions and Secret Rules Investigation 1: Sessions 1–6 Investigation 2: Sessions 1–6 Investigation 3: Sessions 1–3 Investigation 4: Sessions 1–5 Quilt Squares and Block Towns Investigation 1: Sessions 11–12 Bigger, Taller, Heavier, Smaller Investigation 2: Sessions 1–2 Investigation 3: Sessions 1–5 Classroom Routines: Exploring Data
33. Determine whether an object satisfies a simple logical classification rule (e.g., belongs and does not belong) (D-1-E)	Mathematical Thinking at Grade 1 Investigation 5: Session 2 Survey Questions and Secret Rules Investigation 1: Sessions 1–2 Investigation 2: Sessions 3–4 Classroom Routines: Exploring Data, Understanding Time and Changes
34. Appropriately use basic probability vocabulary (e.g., *more likely to happen/less likely to happen*, *always/never, same as*) (D-5-E)	These activities provide opportunities to introduce this expectation. Mathematical Thinking at Grade 1 Investigation 5: Sessions 2, 3–4, 5–6

Patterns, Relations, and Functions

In problem-solving investigations, students demonstrate an understanding of patterns, relations, and functions that represent and explain real-world situations.

Students use number sense, estimation, manipulatives, drawings, tables, graphs, formulas, and technology as they investigate problems involving patterns, relations, and functions.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
35. Identify, describe, and explain the patterns in repeating situations (adding the same number, e.g., 2, 5, 8, 11, or skip-counting) (P-1-E)	Mathematical Thinking at Grade 1 Investigation 3: Sessions 1–6 Investigation 4: Sessions 2–3, 4–6 Building Number Sense Investigation 3: Sessions 1–8 Investigation 4: Session 10 Number Games and Story Problems Investigation 2: Sessions 2, 6–9
36. Explain patterns created with concrete objects, numbers, shapes, and colors (P-2-E)	Mathematical Thinking at Grade 1 Investigation 3: Sessions 1–6 Investigation 3: Sessions 1–6 Investigation 4: Sessions 2–3, 5 Building Number Sense Investigation 3: Sessions 1–8 Investigation 4: Session 10 Survey Questions and Secret Rules Investigation 3: Sessions 2–3 Quilt Squares and Block Towers Investigation 1: Sessions 13–15 Number Games and Story Problems Investigation 2: Sessions 2, 6–9

Book Title: Investigations in Number, Data, & Space **Grade Level:** Two

Publisher: Pearson Scott Foresman **Subject/Course:** Mathematics

Grade 2

Number and Number Relations

In problem-solving investigations, students demonstrate an understanding of the real number system and communicate the relationships within that system using a variety of techniques and tools.

Students use estimation, mental arithmetic, number lines, graphs, appropriate models, manipulatives, calculators, and computers as they investigate problems involving whole numbers.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
1. Model, read, and write place values for numbers through 999 in word, standard, and expanded form (N-1-E)	Coins, Coupons, and Combinations Investigation 3: Session 1, 4–5 Investigation 4: Sessions 1–4 Putting Together and Taking Apart Investigation 1: Sessions 1, 4–5 Investigation 2: Sessions 1–7 Investigation 4: Sessions 2–4 Investigation 5: Sessions 2–3, 4–5, 6
2. Model the concepts of thirds, fourths, fifths and sixths using regions, sets, and fraction words (e.g., one-third, three-fourths, five-sixths) (N-1-E)	Shapes, Halves, and Symmetry Investigation 3: Sessions 1–8
3. Make reasonable estimates of the number of objects in a collection with fewer than 100 objects (N-2-E)	Estimating by using a referent is introduced in Grade 3. See Mathematical Thinking at Grade 3.
4. Count and write the value of amounts of money up to $1.00 using ¢ and $ (N-2-E) (N-6-E) (M-1-E) (M-5-E)	Mathematical Thinking at Grade 2 Investigation 4: Sessions 2–4 Coins, Coupons, and Combinations Investigation 2: Sessions 6–9
5. Read, write, compare, and order whole numbers through 999 using words, number lines, and models (N-3-E) (N-1-E)	Coins, Coupons, and Combinations Investigation 4: Sessions 1–4 Putting Together and Taking Apart Investigation 2: Sessions 3–7 Investigation 4: Session 1
6. From a given number, count forward and backward and count to 100 by 2s (N-3-E) (N-1-E) (N-4-E)	Mathematical Thinking at Grade 2 Investigation 2: Sessions 6 Investigation 4: Sessions 1–4 Investigation 5: Sessions 4–5

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
7. Know all basic facts for addition and subtraction and use them to solve real-life problems (N-5-E) (N-6-E) (N-7-E) (N-8-E) (N-9-E)	Mathematical Thinking at Grade 2 Investigation 1: Session 1 Investigation 2: Sessions 1–5, 8 Session 6: Dialogue Box, page 45 Investigation 4: Session 1 Investigation 5: Session 3 Coins, Coupons, and Combinations Investigation 1: Sessions 1–6, 10–11 Sessions 8–9: Activity, pages 42–44 Putting Together and Taking Apart Investigation 1: Sessions 1–6 Investigation 2: Sessions 1–7 Investigation 3: Sessions 1–5 Investigation 4: Sessions 1–4 Investigation 5: Sessions 1–8
8. Recognize, select, connect, and use operations, operational words and symbols (+, –) for addition (join, part/part/whole) or subtraction (take away, comparison, missing addend, and set/subset) situations (N-6-E) (N-5-E)	Mathematical Thinking at Grade 2 Investigation 2: Session 1, 4–6 Investigation 3: Session 5 Investigation 4: Sessions 1, 5 Coins, Coupons, and Combinations Investigation 1: Sessions 2–11 Investigation 2: Session 7–9 Investigation 3: Sessions 1–5 Investigation 4: Sessions 2–5 Putting Together and Taking Apart Investigation 1: Sessions 1–4 Investigation 2: Sessions 1–4, 7 Investigation 3: Sessions 1–5 Investigation 4: Sessions 1–5 Investigation 5: Sessions 5–4, 7 How Long? How Far? Investigation 1: Sessions 5–7 Classroom Routines: Today's Number

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
9. Add and subtract 1- and 2-digit numbers (N-6-E) (N-7-E)	Mathematical Thinking at Grade 2 Investigation 2: Session 1, 4–6 Investigation 3: Session 5 Investigation 4: Sessions 1, 5 Coins, Coupons, and Combinations Investigation 1: Sessions 2–11 Investigation 2: Session 7–9 Investigation 3: Sessions 1–5 Investigation 4: Sessions 2–5 Putting Together and Taking Apart Investigation 1: Sessions 1–4 Investigation 2: Sessions 1–4, 7 Investigation 3: Sessions 1–5 Investigation 4: Sessions 1–5 Investigation 5: Sessions 5–4, 7 How Long? How Far? Investigation 1: Sessions 5–7 Classroom Routines: Today's Number
10. Round numbers to the nearest 10 or 100 and identify situations in which rounding is appropriate (N-7-E) (N-9-E)	Rounding is introduced in Grade 3.
11. Use the concept of one-to-several correspondence to trade single items for a greater quantity of items with unequal value (1 nickel for 5 pennies, 1 dime for 2 nickels) (N-9-E)	Mathematical Thinking at Grade 2 Investigation 4: Session 2 How Long? How Far? Investigation 1: Sessions 2, 3, 4

Algebra

In problem-solving investigations students demonstrate an understanding of concepts and processes that allow them to analyze, represent, and describe relationships among variable quantities and to apply algebraic methods to real-world situations.

Students use manipulatives, models, graphs, tables, technology, number sense, and estimation as they investigate problems involving the concepts and application of algebra.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
12. Use number sentences to represent real-life problems involving addition and subtraction (A-1-E) (A-2-E)	Putting Together and Taking Apart Investigation 1: Sessions 1–2, 5–6 Investigation 3: Sessions 2–5 Investigation 4: Sessions 2–4 Investigation 5: 1–3 Classroom Routines: Writing equations for the number of days in school
13. Find the missing number in an equation involving addition or subtraction (e.g., # + 4 = 7, 8 - # = 3) (A-2-E) (N-4-E)	Putting Together and Taking Apart Investigation 3: Sessions 2, 3–5 Investigation 5: Sessions 1–3 Classroom Routines: Writing equations for the number of days in school

Measurement

In problem-solving investigations, students demonstrate an understanding of the concepts, processes, and real-life applications of measurement.

Students use number sense, estimation, appropriate manipulatives, tools, and technology as they investigate problems involving measurement.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
14. Measure and appropriately label measures of length and perimeter (i.e., inch, centimeter, foot), capacity (i.e., cup, quart, liter), and weight/mass (i.e., pound, kilogram) (M-1-E)	In Grade 2, students explore linear measurement by using direct and indirect comparison, nonstandard units, and *GeoLogo* software. They construct, compare, and measure simple paths in both on- and off-computer activities. In the Grade 1 curriculum, students lift and balance familiar objects to develop a sense of weight, and use a balance to compare weights. In the Grade 3 curriculum, students learn to weigh objects with a pan balance. How Long? How Far? Investigation 1: Sessions 1–8 Investigation 2: Sessions 4–5 Related content in Grade 3: Exploring Solids and Boxes Investigation 4: Session 1 Investigation 5: Sessions 1–4 Combining and Comparing Investigation 2: Sessions 1–2
15. Read a thermometer in degrees Fahrenheit and Celsius and interpret the temperature (M-1-E)	This expectation can be introduced in Grade 1 during Classroom Routines: Understanding Time and Changes (weather).
16. Tell time to the nearest 5 minutes, and identify the time one hour before or after a given time (M-1-E) (M-3-E)	All curriculum units: Appendix: About Classroom Routines: Time and Time Again Timelines and Rhythm Patterns Investigation 1: Sessions 4–5 Investigation 2: Sessions 4–5

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
17. Select and use appropriate tools and units to measure length, time, capacity, and weight (e.g., scales for pounds and kilograms; rulers for inches and centimeters; measuring containers for cup, quarts, and liters) (M-2-E)	Nonstandard measurements are used at this grade level. How Long? How Far? Investigation 1: Sessions 1–8 Investigation 2: Sessions 1–8
18. Use non-standard units to cover a given region (M-2-E)	Shapes, Halves and Symmetry Investigation 2: Sessions 2, 3, 4–5, 6 Mathematical Thinking at Grade 2 Investigation 3: Session 6
19. Estimate length in standard units (inch, foot, and centimeter) (M-3-E)	Standard units are introduced in Grade 3.
20. Compare units within the **same** system (inch is shorter than a foot, minute is shorter than an hour, day is shorter than a month, cup holds less than a quart) (M-3-E)	Standard units are introduced in Grade 3.

Geometry

In problem-solving investigations, students demonstrate an understanding of geometric concepts and applications involving one-, two-, and three-dimensional geometry, and justify their findings.

Students use number sense, estimation, models, drawings, manipulatives, and technology as they investigate problems involving geometric concepts.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
21. Compare and contrast 3-dimensional shapes (i.e., sphere, cube, cylinder, cone, prism, pyramid) according to their attributes (e.g., number of faces, shape of faces) (G-2-E)	Mathematical Thinking at Grade 2 Investigation 3: Sessions 1–5
22. Identify a reduction or enlargement of a given shape (G-2-E)	Shapes, Halves and Symmetry Investigation 3: Session 6
23. Identify congruent 3-dimensional solids in a variety of positions and orientations (G-3-E) (G-4-E) (G-2-E)	Shapes, Halves and Symmetry Investigation 3: Sessions 1–2
24. Identify and draw horizontal and vertical line segments (G-5-E)	This expectation is addressed in Grade 3.

Data Analysis, Probability, and Discrete Math

In problem-solving investigations, students discover trends, formulate conjectures regarding cause-and-effect relationships, and demonstrate critical thinking skills in order to make informed decisions.

Students use collection and organizational techniques, number sense, estimation, manipulatives, and technology as they investigate problems involving data.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
25. Collect and organize data using observations, surveys, and experiments (D-1-E)	Coins, Coupons, and Combinations Investigation 2: Sessions 2–5, 10 Does it Walk, Crawl, or Swim? Investigation 1: Sessions 1–3 Investigation 4: Sessions 1–3 How Many Pockets? How Many Teeth? Investigation 1: Sessions 2–3 Investigation 2: Sessions 1–5 Investigation 3: Sessions 2–4 Classroom Routine: Keeping track of the number of days in school, Collecting and recording data about pockets
26. Construct and read line plots and tables (D-2-E)	Mathematical Thinking at Grade 2 Investigation 2: Session 6 Investigation 5: Sessions 1–2 Does it Walk, Crawl, or Swim? Investigation 1: Sessions 1–3 Investigation 2: Sessions 3–4 Investigation 3: Sessions 1–3 How Many Pockets? How Many Teeth Investigation 1: Sessions 1–5 Investigation 2: Sessions 1–5 Investigation 3: Sessions 1–5
27. Interpret pictographs in which each picture represents more than one object (D-2-E)	This investigation can be used to introduce this expectation. Mathematical Thinking at Grade 2 Investigation 5: Session 6
28. Generate questions that can be answered by collecting and analyzing data (D-3-E)	How Many Pockets? How Many Teeth Investigation 3: Session 1

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
29. Solve logic problems involving two sets by using elementary set logic (i.e., *and*, *or*, and *is/is not* statements) (D-3-E)	Does it Walk, Crawl, or Swim? Investigation 1: Session 6 Investigation 2: Sessions 1–4 Investigation 3: Sessions 1–3 Investigation 4: Sessions 1–3

Patterns, Relations, and Functions

In problem-solving investigations, students demonstrate an understanding of patterns, relations, and functions that represent and explain real-world situations.

Students use number sense, estimation, manipulatives, drawings, tables, graphs, formulas, and technology as they investigate problems involving patterns, relations, and functions.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
30. Recognize, extend, create, and explain patterns of addition and subtraction as represented in charts and tables and in varied forms of skip-counting (P-1-E) (P-2-E)	Mathematical Thinking at Grade 2 Investigation 4: Sessions 2–4 Coins, Coupons, and Combinations Investigation 1: Session 10 Investigation 2: Sessions 1, 4–5 Investigation 4: Sessions 2–4 Putting Together and Taking Apart Investigation 2: Sessions 1–2
31. Recognize, extend, create, and explain patterns that involve simple rotations or size changes with geometric objects (P-1-E) (P-2-E)	These activities involving symmetry can be adapted to meet this expectation. Shapes, Halves, and Symmetry Investigation 4: Sessions 1–7 See also, Grade 3.
32. Recognize and apply patterns in problem-solving in other content areas and real-life situations (P-3-E) (N-9-E)	Coins, Coupons, and Combinations Investigation 1: Session 10 Investigation 2: Sessions 1, 4–5 Investigation 4: Sessions 2–4 Timelines and Rhythm Patterns Investigation 2: Sessions 1–5

Book Title: Investigations in Number, Data, & Space **Grade Level:** Three

Publisher: Pearson Scott Foresman **Subject/Course:** Mathematics

Grade 3

Number and Number Relations

In problem-solving investigations, students demonstrate an understanding of the real number system and communicate the relationships within that system using a variety of techniques and tools.

Students use estimation, mental arithmetic, number lines, graphs, appropriate models, manipulatives, calculators, and computers as they investigate problems involving whole numbers.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
1. Model, read, and write place value in word, standard, and expanded form for numbers through 9999 (N-1-E)	Mathematical Thinking at Grade 3 Investigation 3: Sessions 3–4 Landmarks in the Hundreds Investigation 1: Sessions 1–3 Investigation 4: Sessions 1–4 Up and Down the Number Line Investigation 1: Sessions 3–4, 6–7 Investigation 2: Sessions 1–3 Combining and Comparing Investigation 1: Sessions 1–3 Investigation 2: Sessions 1–2 Investigation 3: Session 1 Investigation 4: Sessions 1–2 Investigation 5: Sessions 1–3 Fair Shares Investigation 2: Session 3
2. Read, write, compare, and order whole numbers through 9999 using symbols (i.e., <, =, >) and models (N-1-E) (N-3-E)	Mathematical Thinking at Grade 3 Investigation 3: Sessions 3–4 Landmarks in the Hundreds Investigation 1: Sessions 1–3 Investigation 4: Sessions 1–4 Up and Down the Number Line Investigation 1: Sessions 3–4, 6–7 Investigation 2: Sessions 1–3

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
(continued)	Combining and Comparing Investigation 1: Sessions 1–3 Investigation 2: Sessions 1–2 Investigation 3: Session 1 Investigation 4: Sessions 1–2 Investigation 5: Sessions 1–3 Fair Shares Investigation 2: Session 3
3. Use region and set models and symbols to represent, estimate, read, write, and show understanding of fractions through tenths (N-1-E) (N-2-E)	Mathematical Thinking at Grade 3 Investigation 2: Sessions 3–4 Investigation 4: Session 2 Flips, Turns, and Areas Investigation 2: Sessions 1–5 Fair Shares Investigation 1: Sessions 1–4 Investigation 2: Sessions 1–7 Investigation 3: Sessions 1–3
4. Use the concepts of associative and commutative properties of multiplication to simplify computations (N-4-E) (N-7-E)	Things That Come in Groups Investigation 3: Sessions 1–2, 3–4
5. Recognize and model multiplication as a rectangular array or as repeated addition (N-4-E) (N-7-E)	Using Landmarks to Solve Problems Investigation 2: Sessions 5–6 Things That Come in Groups Investigation 1: Session 2 Investigation 2: Session 2 Investigation 3: Sessions 1–5
6. Recognize and model division as separating quantities into equal subsets (fair shares) or as repeated subtraction (N-4-E) (N-7-E)	Using Landmarks to Solve Problems Investigation 2: Sessions 5–6 Things That Come in Groups Investigation 3: Sessions 1, 2, 3 Investigation 4: Sessions 1, 2, 3–4 Investigation 5: Session 1
7. Recognize and apply multiplication and division as inverse operations (N-4-E)	Things That Come in Groups Investigation 1: Session 3 (The Relationship Between Multiplication and Division) Investigation 3: Sessions 3, 4 Investigation 4: Session 1 Investigation 5: Session 4

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
8. Recognize, select, connect, and use operations, operational words, and symbols (i.e., +, –, x, ÷) to solve real-life situations (N-5-E) (N-6-E) (N-9-E)	Mathematical Thinking at Grade 3 Investigation 1: Sessions 1, 2–3 Investigation 2: Sessions 1–7 Investigation 3: Sessions 3–4 Investigation 4: Sessions 1, 2 Things That Come in Groups Investigation 1: Sessions 1–4 Investigation 2: Sessions 1–5 Investigation 3: Investigation 1–3 Investigation 4: Session 1, 3–4 Investigation 5: Sessions 1, 4 Ten-Minute Math Flip, Turns, and Area Investigation 1: Sessions 2–5 Ten-Minute Math From Paces to Feet Ten-Minute Math: Investigation 1 Sessions 2, 5–6 Landmarks in the Hundreds Investigation 1: Sessions 1, 2–3, 6–7 Ten-Minute Math: Investigation 1: Sessions 3–4, 6–7 Investigation 2: Sessions 1–3, 2–4, 5–6 Investigation 3: Sessions 1, 2–3 Up and Down the Number Line Investigation 1: Sessions 1–8 Ten-Minute Math: Investigation 1: Sessions 3, 4, 5 Investigation 3: Sessions 1, 2 Combining and Comparing Investigation 1: Sessions 1, 2 Investigation 2: Sessions 2 Investigation 3: Sessions 1–3 Investigation 4: Sessions 1–4 Ten-Minute Math: Investigation 4: Sessions 3–4 Investigation 5: Sessions 1, 2–3 Ten-Minute Math: Investigation 5: Sessions 2–3

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
(continued)	Turtle Paths Investigation 1: Sessions 1, 3–4 Investigation 2: Sessions 5–6 Fair Shares Investigation 1: Sessions 1, 2 Investigation 2: Session 5–7 Investigation 3: Sessions 1, 2, 3
9. Know basic multiplication and division facts [0s, 1s, 2s, 5s, 9s, and turn-arounds (commutative facts), including multiplying by 10s] (N-6-E) (N-4-E)	Things That Come in Groups Investigation 1: Session 4 Investigation 2: Sessions 1, 2, 3–4, 5–6 Investigation 5: Sessions 1, 3
10. Calculate the value of a combination of bills and coins and make change up to $5.00 (N-6-E) (M-1-E) (M-5-E)	Mathematical Thinking at Grade 3 Investigation 2: Sessions 5–7 Combining and Comparing Investigation 3: Sessions 1–2, 3
11. Add and subtract numbers of 3 digits or less (N-6-E) (N-7-E)	Mathematical Thinking at Grade 3 Investigation 1: Session 1 Investigation 2: Sessions 3–4, 5–7 Investigation 3: Sessions 3–4 Landmarks in the Hundreds Investigation 3: Sessions 2–3 Combining and Comparing Investigation 1: Sessions 1, 3 Investigation 2: Sessions 1, 2 Investigation 3: Sessions 1–2, 3 Investigation 4: Sessions 1–4 Investigation 5: Sessions 1–3 Ten-Minute Math: Estimation and Number Sense Up and Down the Number Line Investigation 1: Sessions 1–8
12. Round to the nearest 1000 and identify situations in which such rounding is appropriate (N-7-E) (N-9-E)	These activities involve concepts that prepare students to round to the nearest 1000. Comparing and Combining Investigation 1: Session 1 Investigation 2: Sessions 1, 2 Investigation 3: Session 1

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
13. Determine when and how to estimate, and when and how to use mental math, calculators, or paper/pencil strategies to solve addition and subtraction problems (N-8-E) (N-9-E)	Throughout this standards–based program, students select appropriate methods and work flexibly with various tools to solve problems. These are a few of the many examples: Mathematical Thinking at Grade 3 Investigation 4: Session 2 From Paces to Feet Investigation 1: Sessions 1–4 Ten Minute Math: Estimation and Number Sense Things That Come in Groups: Investigation 1: Session 4 Investigation 2: Sessions 2–4 Investigation 3: Sessions 1–2 Investigation 4: Sessions 3–4 Investigation 5: Session 3 Landmarks On the Hundreds Chart Investigation 3: Sessions 2–3 Combining and Comparing Investigation 1: Sessions 1–2 Investigation 3: Sessions 1–3 Investigation 4: Sessions 3–4 Investigation 5: Sessions 1–3 Ten Minute Math: Counting Around the Class; Calendar Math Turtle Paths Investigation 2: Sessions 1–2 Investigation 3: Sessions 1–2

Algebra

In problem-solving investigations students demonstrate an understanding of concepts and processes that allow them to analyze, represent, and describe relationships among variable quantities and to apply algebraic methods to real-world situations.

Students use manipulatives, models, graphs, tables, technology, number sense, and estimation as they investigate problems involving the concepts and application of algebra.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
14. Use the symbols <, >, and ≠ to express inequalities (A-1-E)	This investigation involves related content. Combining and Comparing Investigation 4: Session 1 Landmarks in the Hundreds Investigation 1: Sessions 6–7
15. Use objects, pictures, numbers, symbols, and words to represent multiplication and division problem situations (A-1-E)	Mathematical Thinking at Grade 3 Investigation 2: Sessions 3–4 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 Investigation 5: Sessions 1–4 Ten-Minute Math: Counting Around the Class Landmarks in the Hundreds Investigation 1: Sessions 1–7 Investigation 2: Sessions 1–6 Investigation 3: Session 1 Ten-Minute Math: Counting Around the Class
16. Use number sentences to represent real-life problems involving multiplication and division (A-1-E) (N-4-E)	Things That Come in Groups Investigation 1: Sessions 1–4 Investigation 4: Sessions 1–4 Investigation 5: Sessions 1–4 Landmarks in the Hundreds Investigation 2: Sessions 1–6

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
17. Analyze and describe situations where proportional trades or correspondences are required (e.g., trade 2 pieces of candy for 3 pieces of gum, make equivalent actions on pans to keep balance scale in equilibrium, plan for the number of pieces of bread needed for *x* sandwiches) (A-1-E)	Related content: Landmarks in the Hundreds Investigation 1: Sessions 6–7 Fair Shares Investigation 1–4
18. Use letters as variables in mathematical statements that represent real-life problems (e.g., 2 x *n* = 8) (A-2-E)	These activities prepare students to use letters as variables. Things That Come in Groups Investigation 1: Sessions 2–4 Investigation 4: Sessions 1–4 Up and Down the Number Line Investigation 1: Sessions 6–7

Measurement

In problem-solving investigations, students demonstrate an understanding of the concepts, processes, and real-life applications of measurement.

Students use number sense, estimation, appropriate manipulatives, tools, and technology as they investigate problems involving measurement.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
19. Measure length to the nearest yard, meter, and half-inch (M-1-E)	From Paces to Feet Investigation 2: Sessions 1, 2, 3–4, 5, 6–7 Investigation 3: Sessions, 2–3, Investigation 4: Sessions 1, 2, 3
20. Measure capacity using pints and gallons (M-1-E)	Related content: Exploring Solids and Boxes Investigation 4: Session 1 Investigation 5: Sessions 1–4
21. Measure weight using grams and ounces (M-1-E)	Related content: Combining and Comparing Investigation 2: Sessions 1–2

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
22. Find the perimeter of a geometric shape given the length of its sides (M-1-E)	Turtle Paths Investigation 1: Sessions 3–4 Investigation 2: Sessions 5–6 Investigation 3: Sessions 1–5 Ten-Minute Math: Length and Perimeter
23. Find the area in square units of a given rectangle (including squares) drawn on a grid or by covering the region with square tiles (M-1-E)	Flips, Turns, and Area Investigation 1: Sessions 1, 2–3, 4–5 Investigation 2: Sessions 2–3, 4–5
24. Find elapsed time involving hours and minutes, without regrouping, and tell time to the nearest minute (M-1-E) (M-5-E)	Combining and Comparing Investigation 3: Session 3
25. Select and use the appropriate standard units of measure, abbreviations, and tools to measure length and perimeter (i.e., in., cm, ft., yd., m), area (square inch, square centimeter), capacity (i.e., cup, pint, quart, gallon, liter), and weight/mass (i.e., oz., lb., g, kg, ton) (M-2-E)	From Paces to Feet Investigation 1: Sessions 1–6 Investigation 2: Sessions 1–7 Investigation 3: Sessions 1–3 Investigation 4: Sessions 1–3 Combining and Comparing Investigation 2: Sessions 1–2 Investigation 3: Session 2 Investigation 5: Sessions 1–3
26. Order a set of measures within the **same** system (M-3-E)	From Paces to Feet Investigation 2: Sessions 3–4
27. Compare U.S. and metric measurements using approximate reference points without using conversions (e.g., a meter is longer than a yard) (M-3-E) (M-4-E)	Related content: From Paces to Feet Investigation 2: Sessions 6–7 Investigation 3: Sessions 1, 2–3 Investigation 4: Sessions 1–3
28. Estimate length, weight/mass, and capacity (M-3-E)	From Paces to Feet Investigation 2: Sessions 1, 2, 3–4, 5, 6–7 Investigation 3: Sessions, 2–3, Investigation 4: Sessions 1, 2, 3 Combining and Comparing Investigation 2: Sessions 1–2

Geometry

In problem-solving investigations, students demonstrate an understanding of geometric concepts and applications involving one-, two-, and three-dimensional geometry, and justify their findings.

Students use number sense, estimation, models, drawings, manipulatives, and technology as they investigate problems involving geometric concepts.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
29. Classify and describe 2- and 3-dimensional objects according to given attributes (triangle vs. quadrilateral, parallelogram vs. prism) (G-2-E) (G-1-E) (G-4-E)	Exploring Solids and Boxes Investigation 1: Sessions 1, 2 Turtle Paths Investigation 2: Sessions 3, 4 Investigation 3: Sessions 1, 2
30. Apply concepts of congruence, similarity, and symmetry in real-life situations (G-2-E)	Mathematical Thinking at Grade 3 Investigation 2: Sessions 1, 3–4 Flip, Turns, and Area Investigation 2: Sessions 2–3, 4–5
31. Draw or reconstruct figures from visual memory or verbal descriptions (G-3-E)	Students use the *Geo-Logo* computer program and its language to draw a variety of geometric figures. Here are some examples: Turtle Paths Investigation 2: Sessions 5–6 Investigation 3: Sessions 1–2, 3–5
32. Recognize and execute specified flips, turns, and slides of geometric figures using manipulatives and correct terminology (including *clockwise* and *counterclockwise*) (G-3-E)	Flip, Turns, and Area Investigation 1: Sessions 1, 2–3, 5 Investigation 2: Sessions 2–3 Turtle Paths Investigation 1: Sessions 1, 3–4 Investigation 2: Sessions 1–2
33. Construct and draw rectangles (including squares) with given dimensions (e.g., grid paper, square tiles) (G-4-E)	Students use the *Geo-Logo* computer program to study a variety of geometric figures. Here are some examples: Turtle Paths Investigation 2: Sessions 1–2, 3, 4 Investigation 3: Sessions 1–2, 3–5
34. Fold a 2-dimensional net into a 3-dimensional object (G-4-E) (G-1-E)	Exploring Solids and Boxes Investigation 3: Sessions 1, 2 Investigation 4, Sessions 1, 2 Investigation 5: Sessions 1, 2, 3, 4

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
35. Identify, give properties of, and distinguish among points, lines, line segments, planes, rays, and angles (G-5-E)	Exploring Solids and Boxes Investigation 2: Sessions 1, 2 Students use the *Geo-Logo* computer program to study a variety of geometric figures. Students explore the components of these figures. Here are some examples: Turtle Paths Investigation 2: Sessions 3, 4 Investigation 3: Sessions 1, 2
36. Identify and draw segments, rays, and lines that are perpendicular, parallel, and intersecting (G-5-E)	Students use the *Geo-Logo* computer program to study a variety of geometric figures. Students explore the components of these figures. Here are some examples: Turtle Paths Investigation 2: Sessions 3, 4 Investigation 3: Sessions 1, 2
37. Identify, describe, and draw intersecting, horizontal, vertical, parallel, diagonal, and perpendicular lines, rays, and right angles in the real world (G-5-E) (G-6-E)	Students use the *Geo-Logo* computer program to study a variety of geometric figures. Students explore the components of these figures. Here are some examples: Turtle Paths Investigation 2: Sessions 3, 4 Investigation 3: Sessions 1, 2
38. Find the length of a path (that does not include diagonals) between two points on a grid (G-6-E)	Turtle Paths Investigation 1: Sessions 1, 2, 3, 4

Data Analysis, Probability, and Discrete Math

In problem-solving investigations, students discover trends, formulate conjectures regarding cause-and-effect relationships, and demonstrate critical thinking skills in order to make informed decisions.

Students use collection and organizational techniques, number sense, estimation, manipulatives, and technology as they investigate problems involving data.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
39. Identify categories and sort objects based on qualitative (categorical) and quantitative (numerical) characteristics (D-1-E)	Mathematical Thinking at Grade 3 Investigation 3: Sessions 1–2, 3–4 Exploring Solids and Boxes Investigation 1: Session 1
40. Read, describe, and organize a two-circle Venn diagram (D-1-E) (D-2-E)	Venn diagrams are investigated in Grade 1.
41. Explain the word *average* and use it appropriately in discussing what is "typical" of a data set (D-1-E)	From Paces to Feet Investigation 1: Sessions 5–6 Investigation 2: Session 2
42. Match a data set to a graph, table, or chart and vice versa (D-2-E)	Mathematical Thinking at Grade 3 Investigation 3: Sessions 1–2, 3–4 Investigation 3: Sessions 3–4 TMM From Paces to Feet Investigation 2: Sessions 2, 3–4, 5, 6–7
43. Represent and solve problems using data from a variety of sources (e.g., tables, graphs, maps, advertisements) (D-3-E)	Mathematical Thinking at Grade 3 Investigation 1: Sessions 2–3 Investigation 3: Sessions 1–4 Things That Come in Groups Investigation 1: Session 1 Investigation 2: Sessions 1, 5–6 Investigation 5: Sessions 1–4 From Paces to Feet Investigation 1: Sessions 1–2, 5–6 Investigation 2: Session 2 Landmarks in the Hundreds Investigation 1: Sessions 2–3, 6–7 Investigation 2: Sessions 1–3 Investigation 3: Session 1

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
(continued)	Up and Down the Number Line Investigation 1: Sessions 1–2 Investigation 2: Sessions 1–4 Combining and Comparing Investigation 1: Session 3 Investigation 4: Session 1 Ten-Minute Math: Exploring Data Fair Shares Investigation 2: Sessions 5–6
44. Discuss chance situations in terms of *certain/impossible* and *equally likely* (D-5-E)	Things That Come In Groups Ten-Minute Math: Likely or Unlikely Exploring Solids and Boxes Ten-Minute Math: Likely or Unlikely
45. Use manipulatives to discuss the probability of an event (e.g., number cubes, spinners to determine what is most likely or least likely) (D-5-E)	Things That Come In Groups Ten-Minute Math: Likely or Unlikely Exploring Solids and Boxes Investigation 4: Session 2 (Ten-Minute Math) Investigation 5: Sessions 1–4 (Ten-Minute Math)

Patterns, Relations, and Functions

In problem-solving investigations, students demonstrate an understanding of patterns, relations, and functions that represent and explain real-world situations.

Students use number sense, estimation, manipulatives, drawings, tables, graphs, formulas, and technology as they investigate problems involving patterns, relations, and functions.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
46. Identify and model even and odd numbers with objects, pictures, and words (P-1-E)	Mathematical Thinking at Grade 3 Investigation 4: Sessions 1, 2, 3
47. Find patterns to complete tables, state the rule governing the shift between successive terms, and continue the pattern (including growing patterns) (P-1-E) (P-2-E)	Mathematical Thinking at Grade 3 Investigation 1: Sessions 2–3 Things That Come in Groups Investigation 2: Sessions 1–6 Investigation 3: Session 3 Investigation 5: Sessions 1, 4 Landmarks in the Hundreds Ten-Minute Math: Counting Around the Class

Book Title: Investigations in Number, Data, & Space **Grade Level:** Four

Publisher: Pearson Scott Foresman **Subject/Course:** Mathematics

Grade 4

Number and Number Relations

In problem-solving investigations, students demonstrate an understanding of the real number system and communicate the relationships within that system using a variety of techniques and tools.

Students use estimation, mental arithmetic, number lines, graphs, appropriate models, manipulatives, calculators, and computers as they investigate problems involving whole numbers.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
1. Read and write place value in word, standard, and expanded form through 1,000,000 (N-1-E)	Mathematical Thinking at Grade 4 Investigation 1: Sessions 1–5 Different Shapes, Equal Pieces Investigation 1: Sessions 1–5 Investigation 2: Sessions 1–4 Investigation 3: Sessions 1–5 Money, Miles, and Large Numbers Investigation 2: Sessions 1–4 Sunken Ships and Grid Patterns Investigation 2: Session 5 Three Out of Four Like Spaghetti Investigation 1: Sessions 1–4 Landmarks in the Thousands Investigation 3: Session 1 Investigation 4: Session 1
2. Read, write, compare, and order whole numbers using place value concepts, standard notation, and models through 1,000,000 (N-1-E) (N-3-E) (A-1-E)	Mathematical Thinking at Grade 4 Investigation 1: Sessions 1, 4 Landmarks in the Thousand Investigation 1: Session1 Investigation 3: Sessions 1, 2 Investigation 4: Sessions 1–3 The Shape of the Data Investigation 1: Sessions: 2–3 Investigation 2: Sessions 2–3

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
3. Illustrate with manipulatives when a number is divisible by 2, 3, 5, or 10 (N-1-E)	Related content: Landmarks in the Thousands Investigation 1, Session 1
4. Know all basic facts for multiplication and division through 12 x 12 and 144 ÷ 12, and recognize factors of composite numbers less than 50 (N-1-E) (N-6-E) (N-7-E)	Arrays and Shares Investigation 1: Session 3 Investigation 2: Sessions 1, 2–3, 4, 5–6, 7–8 Investigation 3: Sessions 1, 2–4 Packages and Groups Investigation 1: Sessions 1–2, 3
5. Read, write, and relate decimals through hundredths and connect them with corresponding decimal fractions (N-1-E)	Money, Miles, and Large Numbers Investigation 2: Sessions 1–4
6. Model, read, write, compare, order, and represent fractions with denominators through twelfths using region and set models (N-1-E) (A-1-E)	Different Shapes, Equal Pieces Investigation 1: Sessions 2–4 Investigation 2: Sessions 1–2, 3, 4, 5 Investigation 3: Sessions 1–2, 3, 4–5 Three Out of Four Like Spaghetti Investigation 1, Sessions 1, 2
7. Give decimal equivalents of halves, fourths, and tenths (N-2-E) (N-1-E)	Money, Miles, and Large Numbers Investigation 2: Sessions 1–2
8. Use common equivalent reference points for percents (i.e., ¼, ½, ¾, and 1 whole) (N-2-E)	Percent is investigated in Grade 5. See Name That Portion.
9. Estimate fractional amounts through twelfths, using pictures, models, and diagrams (N-2-E)	Related content: Three Out of Four Like Spaghetti Investigation 1: Sessions 1–3
10. Solve multiplication and division number sentences including interpreting remainders (N-4-E) (A-3-E)	Arrays and Shares Investigation 2: Sessions 1, 2–3, 7–8 Investigation 3: Sessions 2–4 Landmarks in the Thousands Investigation 2: Session 5 Packages and Groups Investigation 3: Sessions 1–2, 4–6

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
11. Multiply 3-digit by 1-digit numbers, 2-digit by 2-digit numbers, and divide 3-digit numbers by 1-digit numbers, with and without remainders (N-6-E) (N-7-E)	Mathematical Thinking at Grade 4 Investigation 3: Sessions 4–5 Arrays and Shares Investigation 1: Sessions 1–4 Investigation 2: Sessions 2–6 Investigation 3: Sessions 2–4 Landmarks in the Thousands Investigation 2: Session 1 Packages and Groups Investigation 2: Sessions 1–3 Investigation 3: Sessions 4–6
12. Count money, determine change, and solve simple word problems involving money amounts using decimal notation (N-6-E) (N-9-E) (M-1-E) (M-5-E)	Mathematical Thinking at Grade 4 Investigation 2: Sessions 1–4 Money, Miles, and Large Numbers Investigation 1: Sessions 6, 7–8 Investigation 2: Sessions 6–8
13. Determine when and how to estimate, and when and how to use mental math, calculators, or paper/pencil strategies to solve multiplication and division problems (N-8-E)	Mathematical Thinking at Grade 4 Investigation 1: Sessions 1–4 Investigation 2: Sessions 1–4 Ten-Minute Math: Estimation and Number Sense Landmarks in the Thousands Investigation 2: Session 1 Investigation 3: Sessions 3–5 Money, Miles, and Large Numbers Investigation 1: Sessions 1–2, 4–5, 7–8 Investigation 2: Session 3 Investigation 3: Sessions 1–4 Packages and Groups Investigation 1: Sessions 4–5 Investigation 2: Sessions 2–3 Investigation 3: Sessions 4–6

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
14. Solve real-life problems, including those in which some information is not given (N-9-E)	Mathematical Thinking at Grade 4 Investigation 3: Sessions 4–5 Arrays and Shares Investigation 1: Sessions 1–4 Investigation 2: Sessions 2–6 Investigation 3: Sessions 2–4 Landmarks in the Thousands Investigation 2: Session 1 Packages and Groups Investigation 2: Sessions 1–3 Investigation 3: Sessions 4–6 Money, Miles, and Large Numbers Investigation 1: Sessions 1–2, 4–5, 7–8 Investigation 2: Session 3 Investigation 3: Sessions 1–4 Different Shapes, Equal Pieces Investigation 1: Sessions 2–4 Investigation 2: Sessions 1–2, 3, 4, 5 Investigation 3: Sessions 1–2, 3, 4–5 The Shape of the Data Investigation 1: Sessions 1, 2–3, 6–7 Investigation 2: Sessions 1, 4, 5–7 Investigation 3: Session 1 Changes Over Time Investigation 1: Sessions 3–4, 6–7 Investigation 3: Sessions 1–8 Seeing Solids and Silhouettes Investigation 2: Session 5 Investigation 3: Sessions 1–3

Algebra

In problem-solving investigations students demonstrate an understanding of concepts and processes that allow them to analyze, represent, and describe relationships among variable quantities and to apply algebraic methods to real-world situations.

Students use manipulatives, models, graphs, tables, technology, number sense, and estimation as they investigate problems involving the concepts and application of algebra.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
15. Write number sentences or formulas containing a variable to represent real-life problems (A-1-E)	Arrays and Shares Investigation 2: Sessions 1, 2–3, 7–8 Investigation 3: Sessions 2–4 Landmarks in the Thousands Investigation 2: Session 5 Packages and Groups Investigation 3: Sessions 1–2, 4–6
16. Write a related story problem for a given algebraic sentence (A-1-E)	Related content: Changes Over Time Investigation 1, Sessions 5–6
17. Use manipulatives to represent the distributive property of multiplication over addition to explain multiplying numbers (A-1-E) (A-2-E)	The Distributive Property can be introduced in these activities. Arrays and Shares Investigation 2: Session 4 Investigation 3: Session 5
18. Identify and create true/false and open/closed number sentences (A-2-E)	This expectation is investigated in Grade 5. See Patterns of Change.
19. Solve one-step equations with whole number solutions (A-2-E) (N-4-E)	Arrays and Shares Investigation 3: Sessions 2–4 Different Shapes, Equal Pieces Investigation 1: Session 5

Measurement

In problem-solving investigations, students demonstrate an understanding of the concepts, processes, and real-life applications of measurement.

Students use number sense, estimation, appropriate manipulatives, tools, and technology as they investigate problems involving measurement.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
20. Measure length to the nearest quarter-inch and mm (M-2-E) (M-1-E)	The Shape of Data Investigation 2: Sessions 2–3 Changes Over Time Unit Preparation: Preparation Session 3
21. Describe the concept of volume, and measure volume using cubic in. and cubic cm and capacity using fl. oz. and ml (M-2-E) (M-3-E)	Seeing Solids and Silhouettes Investigation 1: Session 1
22. Select and use the appropriate standard units of measure, abbreviations, and tools to measure length and perimeter (i.e., in., cm, ft., yd., mile, m, km), area (i.e., square inch, square foot, square centimeter), capacity (i.e., fl. oz., cup, pt., qt., gal., l, ml), weight/mass (i.e., oz., lb., g, kg, ton), and volume (i.e., cubic cm, cubic in.) (M-2-E) (M-1-E)	Money, Miles, and Large Numbers Investigation 2: Session 3 Investigation 3: Sessions 2–4
23. Set up, solve, and interpret elapsed time problems (M-2-E) (M-5-E)	The Shape of the Data Investigation 3: Sessions 1–2 These investigations involve time in the sense of growth and speed. Changes Over Time Investigation 3: Sessions 1–2, 3
24. Recognize the attributes to be measured in a real-life situation (M-2-E) (M-5-E)	The Shape of Data Investigation 2: Sessions 2–3 Changes Over Time Unit Preparation: Preparation Session 3

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
25. Use estimates and measurements to calculate perimeter and area of rectangular objects (including squares) in U.S. (including square feet) and metric units (M-3-E)	These investigations involve geoboards and dot paper (area) and Geo–Logo (perimeter). Different Shapes, Equal Pieces Investigation 1: Sessions 2, 3, 4 Investigation 2: Sessions 1–2 Sunken Ships and Grid Patterns Investigation Ten-Minute Math: Lengths and Perimeters
26. Estimate the area of an irregular shape drawn on a unit grid (M-3-E)	Different Shapes, Equal Pieces Investigation 1: Sessions 2–4
27. Use unit conversions within the same system to solve real-life problems (e.g., 60 sec. = 1 min., 12 objects = 1 dozen, 12 in. = 1 ft., 100 cm = 1 m, 1 pt. = 2 cups) (M-4-E) (N-2-E) (M-5-E)	Unit conversions are investigated in Grade 5.

Geometry

In problem-solving investigations, students demonstrate an understanding of geometric concepts and applications involving one-, two-, and three-dimensional geometry, and justify their findings.

Students use number sense, estimation, models, drawings, manipulatives, and technology as they investigate problems involving geometric concepts.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
28. Identify the top, bottom, or side view of a given 3-dimensional object (G-1-E) (G-3-E)	Seeing Solids and Silhouettes Investigation 1: Sessions 3–4, 5 Investigation 2: Sessions 1–2, 3–4 Investigation 3: Sessions 1, 2–3
29. Identify, describe the properties of, and draw circles and polygons (triangle, quadrilateral, parallelogram, trapezoid, rectangle, square, rhombus, pentagon, hexagon, octagon, and decagon) (G-2-E)	Mathematical Thinking in Grade 4 Investigation 4: Sessions 1, 2, 3–4, 5–6 Seeing Solids and Silhouettes Investigation 2: Sessions 1–2 Sunken Ships and Grid Patterns Investigation 2: Session 1, 2–3, 6–7

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
30. Make and test predictions regarding transformations (i.e., slides, flips, and turns) of plane geometric shapes (G-3-E)	Mathematical Thinking at Grade 4 Investigation 4: Sessions 1–2, 5–6 Sunken Ships and Grid Patterns Investigation 2: Sessions 1–9
31. Identify, manipulate, and predict the results of rotations of 90, 180, 270, and 360 degrees on a given figure (G-3-E)	Sunken Ships and Grid Patterns Investigation 2: Sessions 1–9
32. Draw, identify, and classify angles that are acute, right, and obtuse (G-5-E) (G-1-E)	These classifications can be introduced during this investigation. Sunken Ships and Grid patterns Investigation 2: Session 5
33. Specify locations of points in the first quadrant of coordinate systems and describe paths on maps (G-6-E)	Sunken Ships and Grid Patterns Investigation 1: Sessions 1–6 Investigation 2: Sessions 1–9 Ten-Minute Math: Lengths and Perimeters

Data Analysis, Probability, and Discrete Math

In problem-solving investigations, students discover trends, formulate conjectures regarding cause-and-effect relationships, and demonstrate critical thinking skills in order to make informed decisions.

Students use collection and organizational techniques, number sense, estimation, manipulatives, and technology as they investigate problems involving data.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
34. Summarize information and relationships revealed by patterns or trends in a graph, and use the information to make predictions (D-1-E)	The Shape of the Data Investigation 1: Sessions 1, 2–3, 6–7 Investigation 2: Sessions 1, 4, 5–7 Investigation 3: Session 1 Changes Over Time Investigation 1: Sessions 3–4, 6–7 Investigation 3: Sessions 1–8

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
35. Find and interpret the meaning of mean, mode, and median of a small set of numbers (using concrete objects) when the answer is a whole number (D-1-E)	The Shape of the Data Investigation 2: Sessions 4, 5, 6–7 Investigation 3: Session 1–3
36. Analyze, describe, interpret, and construct various types of charts and graphs using appropriate titles, axis labels, scales, and legends (D-2-E) (D-1-E)	The Shape of Data Investigation 1: Sessions 1, 2–3 Investigation 2: Sessions 1–7 Investigation 3: Sessions 3–5 Changes Over Time Investigation 1: Sessions 1–2 Investigation 2: Sessions 1–2 Investigation 3: Sessions 1–8 Three Out of Four Like Spaghetti Investigation 1: Session 2 Investigation 2: Sessions 4, 5–7 Investigation 3: Sessions 1–5
37. Determine which type of graph best represents a given set of discrete data (D-2-E) (D-1-E)	Changes Over Time Investigation 1, Sessions 1–2, 3–4 Three Out of Four Like Spaghetti Investigation 2: Sessions 2–3 Investigation 3, Sessions 1–5
38. Solve problems involving simple deductive reasoning (D-3-E)	Changes Over Time Investigation 3: Sessions 3, 4, 5, 6–7
39. Use lists, tables, and tree diagrams to generate and record all possible combinations for 2 sets of 3 or fewer objects (e.g., combinations of pants and shirts, days and games) and for given experiments (D-3-E) (D-4-E)	Related content: Three Out of Four Like Spaghetti Ten-Minute Math: What Is Likely?
40. Determine the total number of possible outcomes for a given experiment using lists, tables, and tree diagrams (e.g., spinning a spinner, tossing 2 coins) (D-4-E) (D-5-E)	Related content: Landmarks in the Thousands Ten-Minute Math: What Is Likely? Money, Miles, and Large Numbers Ten-Minute Math: Likely or Unlikely? Three Out of Four Like Spaghetti Ten-Minute Math: What Is Likely? *See also, Grade 5.*

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
41. Apply appropriate probabilistic reasoning in real-life contexts using games and other activities (e.g., examining fair and unfair situations) (D-5-E) (D-6-E)	Probabilistic reasoning is investigated in depth in Grade 5. See Between Never and Always.

Patterns, Relations, and Functions

In problem-solving investigations, students demonstrate an understanding of patterns, relations, and functions that represent and explain real-world situations.

Students use number sense, estimation, manipulatives, drawings, tables, graphs, formulas, and technology as they investigate problems involving patterns, relations, and functions.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
42. Find and describe patterns resulting from operations involving even and odd numbers (such as even + even = even) (P-1-E)	See Mathematical Thinking at Grade 3.
43. Identify missing elements in a number pattern (P-1-E)	Mathematical Thinking at Grade 4 Investigation 3: Sessions 1–2, 3 Arrays and Shares Investigation 1: Sessions 1–2 Ten-Minute Math: Counting Around the Class
44. Represent the relationship in an input-output situation using a simple equation, graph, table, or word description (P-2-E)	This objective is covered in Grade 5.

Book Title: Investigations in Number, Data, & Space **Grade Level:** Five

Publisher: Pearson Scott Foresman **Subject/Course:** Mathematics

Grade 5

Number and Number Relations

In problem-solving investigations, students demonstrate an understanding of the real number system and communicate the relationships within that system using a variety of techniques and tools.

Students use estimation, mental arithmetic, number lines, graphs, appropriate models, manipulatives, calculators, and computers as they extend their investigations of problems involving rational numbers.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
1. Differentiate between the terms *factor* and *multiple*, and *prime* and *composite* (N-1-M)	Mathematical Thinking at Grade 5 Investigation 1: Sessions 1–3, 4–6 Building on Numbers You Know Investigation 4: Sessions 1–2 Investigation 5; Sessions 4–6 Between Never and Always Investigation 1: Sessions 7 Measurement Benchmarks Ten-Minute Math: Guess My Number Name That Portion Ten-Minute Math: Seeing Numbers Picturing Polygons Ten-Minute Math: Multiple and Factor Bingo
2. Recognize, explain, and compute equivalent fractions for common fractions (N-1-M) (N-3-M)	Name That Portion Investigation 1: Sessions 2–8 Investigation 3: Session 8 Data: Kids, Cats, and Ads Investigation 1: Session 1
3. Add and subtract fractions with common denominators and use mental math to determine whether the answer is reasonable (N-2-M)	Name That Portion Investigation 2: Sessions 1–2, 3, 6, 7, 9 Investigation 3: Session 7

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
4. Compare positive fractions using number sense, symbols (i.e., <, =, >), and number lines (N-2-M)	Name That Portion Investigation 2: Sessions 4–9 Data: Kids, Cats, and Ads Investigation 1: Sessions 1–4 Investigation 2: Sessions 1–3 Investigation 3: Sessions 1–3 Investigation 4: Sessions 1–3 Investigation 5: Sessions 3–5 Measurement Benchmarks Ten-Minute Math: Estimation and Number Sense
5. Read, explain, and write a numerical representation for positive improper fractions, mixed numbers, and decimals from a pictorial representation and vice versa (N-3-M)	Name That Portion Investigation 1: Sessions 3–4, 7 Investigation 2: Sessions 1–9 Investigation 3: Sessions 1–4 Ten-Minute Math: Seeing Numbers
6. Select and discuss the correct operation for a given problem involving positive fractions using appropriate language such as *sum*, *difference*, *numerator*, and *denominator* (N-4-M) (N-5-M)	Name That Portion Investigation 1: Session 7 Investigation 2: Sessions 6, 7–8 Investigation 3: Sessions 5–6, 7 Investigation 4: Session 7
7. Select, sequence, and use appropriate operations to solve multi-step word problems with whole numbers (N-5-M) (N-4-M)	Building on Numbers You Know Investigation 3: Sessions 1–10 Investigation 5: Sessions 4–6 Measurement Benchmarks Investigation 3: Sessions 2, 3
8. Use the whole number system (e.g., computational fluency, place value, etc.) to solve problems in real-life and other content areas (N-5-M)	Mathematical Thinking at Grade 5 Investigation 2: Sessions 2–5 Investigation 3: Sessions 1–5 Investigation 4: Sessions 1–5 Building on Numbers You Know Investigation 1: Sessions 1–8 Investigation 2: Sessions 1–3,5–6 Investigation 3: Sessions 4–10 Investigation 4: Sessions 1–2 Investigation 5: Sessions 1–8 Measurement Benchmarks Investigation 1: Sessions 7–8 Ten-Minute Math: Estimation and Number Sense Data: Kids, Cats and Ads Ten-Minute Math: The Digits Game

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
9. Use mental math and estimation strategies to predict the results of computations (i.e., whole numbers, addition and subtraction of fractions) and to test the reasonableness of solutions (N-6-M) (N-2-M)	Mathematical Thinking at Grade 5 Investigation 3: Sessions 2–4 Investigation 4: Sessions 1, 2, 3, 4 Building on Numbers You Know Investigation 1: Sessions 2–8 Investigation 2: Sessions 1–7 Investigation 3: Sessions 1–10 Investigation 4: Sessions 1–2 Investigation 5: Sessions 1–8 Measurement Benchmarks Investigation 2: Session 3 Ten-Minute Math: Estimation and Number Sense Between Never and Always Ten-Minute Math: Nearest Answer Patterns of Change Ten-Minute Math: Nearest Answer
10. Determine when an estimate is sufficient and when an exact answer is needed in real-life problems using whole numbers (N-6-M) (N-5-M)	Measurement Benchmarks Investigation 1: Sessions 2–3, 7–8
11. Explain concepts of ratios and equivalent ratios using models and pictures in real-life problems (e.g., understand that 2/3 means 2 divided by 3) (N-8-M) (N-5-M)	Building on Numbers You Know Ten-Minute Math: What Is Likely? Name That Portion Investigation 1: Sessions 1, 2, 3–4 Investigation 2: Sessions 1–2 Investigation 3: Sessions 1, 2

Algebra

In problem-solving investigations students demonstrate an understanding of concepts and processes that allow them to analyze, represent, and describe relationships among variable quantities and to apply algebraic methods to real-world situations.

Students use manipulatives, models, graphs, tables, technology, number sense, and estimation as they extend their investigations of problems involving the concepts and application of algebra.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
12. Find unknown quantities in number sentences by using mental math, backward reasoning, inverse operations (i.e., unwrapping), and manipulatives (e.g., tiles, balance scales) (A-2-M) (A-3-M)	Mathematical Thinking at Grade 5 Investigation 2: Sessions 1–4 Investigation 3: Sessions 2–5 Investigation 4: Sessions 1–6 Name that Portion Investigation 2: Sessions 1–9 Investigation 3: Sessions 1–8 Investigation 4: Sessions 1–7 Ten-Minute Math: Seeing Numbers Building on Numbers You Know Investigation 1: Sessions 1, 3–4, 6–8 Investigation 2: Sessions 1–2, 5–6 Investigation 3: Sessions 1–10 Investigation 4: Session 1 Investigation 5: Sessions 4–7
13. Write a number sentence from a given physical model of an equation (e.g., balance scale) (A-2-M) (A-1-M)	Most of these activities address related content. There are many opportunities to investigate algebra topics in Patterns of Change. Mathematical Thinking at Grade 5 Investigation 2: Session 1 Investigation 3: Session 2–5 Investigation 4: Session 1 Name that Portion Ten-Minute Math: Seeing Numbers Building on Numbers You Know Investigation 1: Sessions 1, 3–4, 6–8 Investigation 2: Sessions 1–2, 5–6 Investigation 3: Session 1–10 Investigation 4: Session 1 Investigation 5: Session 4–7

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
(continued)	Patterns of Change Investigation 1: Sessions 3–4 Investigation 2: Session 1: Ten-Minute Math:
14. Find solutions to one-step inequalities and identify positive solutions on a number line (A-2-M) (A-3-M)	Limits and inequalities can be introduced during this activity. Patterns of Change Investigation 3: Session 1

Measurement

In problem-solving investigations, students demonstrate an understanding of the concepts, processes, and real-life applications of measurement.

Students use number sense, estimation, appropriate manipulatives, tools, and technology as they extend their investigations of problems involving measurement.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
15. Model, measure, and use the names of all common units in the U.S. and metric systems (M-1-M)	Measurement Benchmarks Investigation 1: Session 1 Investigation 2: Sessions 1–2, 4
16. Apply the concepts of elapsed time in real-life situations and calculate equivalent times across time zones in real-life problems (M-1-M) (M-6-M)	This activity provides the opportunity for students to apply this expectation. Measurement Benchmarks Investigation 3: Session 1 *See also, Grade 3.*
17. Distinguish among the processes of counting, calculating, and measuring and determine which is the most appropriate strategy for a given situation (M-2-M)	Measurement Benchmarks Investigation 1, Sessions 5–6, 7–8 Investigation 2: Session 5 Investigation 3: Sessions 2, 3 Picturing Polygons Investigation 2: Sessions 1–2, 6–9 Investigation 3: Session 1–3 Containers and Cubes Investigation 3: Sessions 1–2, 3, 4
18. Estimate time, temperature, weight/mass, and length in familiar situations and explain the reasonableness of answers (M-2-M)	Measurement Benchmarks Investigation 1: Sessions 5–6, 7–8 Investigation 2: Session 3

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
19. Compare the relative sizes of common units for time, temperature, weight, mass, and length in real-life situations (M-2-M) (M-4-M)	Measurement Benchmarks Investigation 2: Sessions 7–8
20. Identify appropriate tools and units with which to measure time, mass, weight, temperature, and length (M-3-M)	Measurement Benchmarks Investigation 1: Sessions 1, 3, 4, 5–6, 7 Investigation 2: Sessions 3, 4 Investigation 3: Session 1
21. Measure angles to the nearest degree (M-3-M)	Picturing Polygons Investigation 2: Sessions 1–3, 8 Investigation 3: Sessions 1–3
22. Compare and estimate measurements between the U.S. and metric systems in terms of common reference points (e.g., l vs. qt., m vs. yd.) (M-4-M)	Measurement Benchmarks Investigation 2: Sessions 1–8
23. Convert between units of measurement for length, weight, and time, in U.S. and metric, within the same system (M-5-M)	Measurement Benchmarks Investigation 2: Sessions 1–8

Geometry

In problem-solving investigations, students demonstrate an understanding of geometric concepts and applications involving one-, two-, and three-dimensional geometry, and justify their findings.

Students use number sense, estimation, models, drawings, manipulatives, and technology as they extend their investigations of problems involving geometric concepts.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
24. Use mathematical terms to classify and describe the properties of 2-dimensional shapes, including circles, triangles, and polygons (G-2-M)	Measurement Benchmarks Ten-Minute Math: Quick Images Picturing Polygons Investigation 1: Session 2 Investigation 2: Sessions 1–5 Investigation 3: Sessions 1–2
25. Identify and use appropriate terminology for transformations (e.g., *translation* as *slide*, *reflection* as *flip*, and *rotation* as *turn*) (G-3-M)	These activities provide opportunities for students to extend this expectation. Picturing Polygons Investigation 2: Sessions 4–5, 9 Investigation 3: Session 3 Investigation 3: Sessions 5–7
26. Identify shapes that have rotational symmetry (G-3-M)	These activities provide opportunities for students to extend this expectation. Picturing Polygons Investigation 2: Sessions 4–5, 9 Investigation 3: Session 3 Investigation 3: Sessions 5–7 See also, Grade 4: Mathematical Thinking at Grade 4, and Sunken Ships and Grid Patterns.
27. Identify and plot points on a coordinate grid in the first quadrant (G-6-M)	Picturing Polygons Investigation 1: Sessions 3–4 Investigation 2: Sessions 4–5

Data Analysis, Probability, and Discrete Math

In problem-solving investigations, students discover trends, formulate conjectures regarding cause-and-effect relationships, and demonstrate critical thinking skills in order to make informed decisions.

Students use collection and organizational techniques, number sense, estimation, manipulatives, and technology as they extend their investigations of problems involving data.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
28. Use various types of charts and graphs, including double bar graphs, to organize, display, and interpret data and discuss patterns verbally and in writing (D-1-M) (D-2-M) (P-3-M) (A-4-M)	Name That Portion Investigation 4: Sessions 1–7 Between Never and Always Investigation 1: Sessions 3–6 Investigation 2: Sessions 1–3 Measurement Benchmarks Investigation 2: Sessions 7–8 Investigation 3: Sessions 1–2 Patterns of Change Investigation 1: Sessions 1–4 Investigation 2: Sessions 1–5 Investigation 3: Sessions 1–6 Ten Minute Math: Graph Stories Data: Kids, Cats, and Ads Investigation 1: Sessions 1–4 Investigation 2: Sessions 1–3 Investigation 3: Sessions 2–4 Investigation 4: Sessions 2–3 Investigation 5: Sessions 2–5
29. Compare and contrast different scales and labels for bar and line graphs (D-1-M)	Patterns of Change Investigation 3: Sessions 5, 6 Data: Kids, Cats, and Ads Investigation 1: Sessions 1 Investigation 5: Sessions 3, 4, 5
30. Organize and display data using spreadsheets, with technology (D-1-M)	In these activities, students use computer technology to enter, analyze, and examine data. Data: Kids, Cats, and Ads Investigation 2: Session 3 Investigation 5: Sessions 3–5

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
31. Compare and contrast survey data from two groups relative to the same question (D-2-M)	Data: Kids, Cats, and Ads Investigation 1: Sessions 1–4 Investigation 2: Sessions 1–3 Investigation 3: Sessions 1–4 Investigation 4: Sessions 2–3 Investigation 5: Sessions 2–5
32. Represent probabilities as common fractions and recognize that probabilities fall between 0 and 1, inclusive (D-5-M)	Between Never and Always Investigation 1: Sessions 3–4, 5

Patterns, Relations, and Functions

In problem-solving investigations, students demonstrate an understanding of patterns, relations, and functions that represent and explain real-world situations.

Students use number sense, estimation, manipulatives, drawings, tables, graphs, formulas, and technology as they extend their investigations of problems involving patterns, relations, and functions.

GRADE LEVEL EXPECTATIONS	CORRELATION NOTATIONS
33. Fill in missing elements in sequences of designs, number patterns, positioned figures, and quantities of objects (P-1-M)	Patterns of Change Investigation 1: Sessions 1–4