

A Correlation of



to the

Louisiana
Department of Education
Mathematics—Grade Level Expectations
Grade Four



C/M-92_4

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: Session 1 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 12×12 and $144 \div 12$, 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., $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 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 |
|---|---|
| <p>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)</p> | <p>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</p> |
| <p>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)</p> | <p>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</p> |
| <p>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)</p> | <p>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</p> |

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

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 |
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| 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 |
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| 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? <i>See also, Grade 5.</i> |

| 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 expectation is covered in Grade 5. |