

A Correlation of



to the

Kansas
Curricular Standards for Mathematics
Kindergarten



G/M-219_K

INTRODUCTION

This document demonstrates how well **Investigations in Number, Data, and Space®** integrates with the Kansas Curricular Standards for Mathematics. The citations within this correlation provide Investigation Curriculum Unit titles, Investigation numbers and Session numbers or Focus Time/Choice Time titles correlated to the Kansas Curricular Standards for Mathematics.

Investigations in Number, Data, and Space®, a Kindergarten through Grade 5 program, offers a complete and flexible curriculum that aligns with the NCTM principles and Standards for School Mathematics. The main teaching tool is a single resource book, called the *teacher book*, for each unit in a grade level. Students explore the central topics in depth through a series of investigations, gradually encountering and using many important mathematical ideas. ***Investigations*** offers activity-based mathematics that encourages 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.

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.

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.

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.

**Investigations in Number, Data, and Space
to the
Kansas Curricular Standards for Mathematics
KINDERGARTEN**

Standard 1: Number and Computation – The student uses numerical and computational concepts and procedures in a variety of situations.

Benchmark 1: Number Sense – The student demonstrates number sense for whole numbers, fractions, and money using concrete objects in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|---|
| <p>The student...</p> <p>1. establishes a one-to-one correspondence with whole numbers from 0 through 20 using concrete objects and identifies, states, and writes the appropriate cardinal number (2.4.K1a) (\$).</p> | <p>Mathematical Thinking in Kindergarten Investigations 1, 2, 3 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 <i>All Units: Appendix: About Classroom Routines: Counting Jar</i></p> |
| <p>2. compares and orders whole numbers from 0 through 20 using concrete objects (2.4.K1a) (\$).</p> | <p>Mathematical Thinking in Kindergarten Investigation 4: page 57 Collecting, Counting, and Measuring Investigations 3, 4, 5</p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|--|---|
| (continued) | How Many in All? Investigation 2: Choice Time: Grab Two Handfuls, pages 40-41 <i>All Units: Appendix: About Classroom Routines: Attendance, Counting Jar</i> |
| 3. recognizes a whole, a half, and parts of a whole using concrete objects (2.4.K1a,c) (\$), e.g., half a pizza, part of a cookie, or the whole school. | How Many in All? Investigation 1 |
| 4. identifies positions as first and last (2.4.K1a). | A Teacher Note describes the distinction between ordinal and cardinal properties of numbers. References: Mathematical Thinking in Kindergarten Investigation 2: Teacher Note, page 36 Collecting, Counting, and Measuring Investigation 1: Teacher Note, page 16 Counting Ourselves and Others Investigation 1: Teacher Note, page 12 |
| 5. identifies pennies and dimes and states the value of the coins using money models (2.4.K1d) (\$). | Counting Ourselves and Others Investigation 2: Choice Time: page 50 |

Benchmark 2: Number Systems and Their Properties – The student demonstrates an understanding of whole numbers with a special emphasis on place value in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>The student...</p> <p>1. reads and writes whole numbers from 0 through 20 in numerical form (\$).</p> | <p>Mathematical Thinking in Kindergarten Investigations 1-3</p> <p>Collecting, Counting, and Measuring Investigations 1-5</p> <p>Counting Ourselves and Others Investigations 1, 3, 4</p> <p>How Many in All? Investigations 1-4</p> <p><i>All Units: Appendix: About Classroom Routines: The Counting Jar</i></p> |
| <p>2. represents whole numbers from 0 through 20 using place value models (2.4.K1b) (\$), e.g., ten frames, unifix cubes, straws bundled in 10s, or base ten blocks.</p> | <p>Mathematical Thinking in Kindergarten Investigations 1, 2</p> <p>Collecting, Counting, and Measuring Investigations 1, 2, 3, 4, 5</p> <p>Counting Ourselves and Others Investigation 1, 4</p> <p>How Many in All? Investigation 3, page 61</p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|---|
| <p>3. counts (2.4.K1a) (\$):</p> <p>a. whole numbers from 0 through 20,</p> | <p>Mathematical Thinking in Kindergarten Investigations 1-3</p> <p>Collecting, Counting, and Measuring Investigations 1-5</p> <p>Counting Ourselves and Others Investigations 1, 3, 4</p> <p>How Many in All? Investigations 1-4</p> <p><i>All Units: Appendix: About Classroom Routines: The Counting Jar</i></p> |
| <p>b. whole numbers from 10 to 0 backwards,</p> | <p>Kindergarten students may count back to solve story problems involving separating, or to determine how many students are present in class when the number of absent students is given.</p> <p>References:</p> <p>How Many in All? Investigation 3</p> <p><i>All units: Appendix: About Classroom Routines: Attendance</i></p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>c. subsets of whole numbers from 0 through 20.</p> | <p>Mathematical Thinking in Kindergarten Investigations 1-3 Collecting, Counting, and Measuring Investigations 1-5 Counting Ourselves and Others Investigations 1, 3, 4 How Many in All? Investigations 1-4 <i>All Units: Appendix: About Classroom Routines: The Counting Jar, Attendance</i></p> |
| <p>4. groups objects by 5s and by 10s (2.4.K1a).</p> | <p>Mathematical Thinking in Kindergarten Investigation 2: Teacher Note, page 36 Collecting, Counting, and Measuring Investigation 1: Teacher Note, page 16 Counting Ourselves and Others Investigation 1 Teacher Note, page 12 How Many in All? Investigation 1: Teacher Note, page 26</p> |
| <p>5. uses the concept of the zero property of addition (additive identity) with whole numbers from 0 through 20 and demonstrates its meaning using concrete objects (2.4.K1a) (\$), e.g., 4 apples and no (zero) other apples are 4 apples.</p> | <p>Students are introduced to the concept of zero in activities involving counting and combining. References: Collecting, Counting, and Measuring Investigations 1: Focus Time, pages 6-7 How Many in All? Investigation 2: Choice Time, page 44 Investigation 3: Choice Time, page 67</p> |

Benchmark 3: Estimation – The student uses computational estimation with whole numbers in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|---|
| <p>The student...</p> <p>1. determines if a group of 20 concrete objects or less has more, less, or about the same number of concrete objects as a second set of the same kind of objects (2.4.K1a).</p> | <p>Mathematical Thinking in Kindergarten Investigation 4 Collecting, Counting, and Measuring Investigations 3-6 How Many in All? Investigation 2: Choice Time: Grab Two Handfuls, pages 40-41</p> |

Benchmark 4: Computation – The student models, performs, and explains computation with whole numbers using concrete objects in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|--|--|
| <p>The student...</p> <p>1. adds and subtracts using whole numbers from 0 through 10 and various mathematical models (2.4.K1a) (\$), e.g., concrete objects, number lines, or unifix cubes.</p> | <p>Collecting, Counting, and Measuring Investigation 4: Choice Time: Collect 10 Together How Many in All? Investigations 2-4</p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>2. uses repeated addition (multiplication) with whole numbers to find the sum when given the number of groups (three or less) and given the same number of concrete objects in each group (five or less) (2.4.K1a), e.g., two nests with three eggs in each nest means $3 + 3 = 6$ or 2 groups of 3 makes 6.</p> | <p>Students may use counting by groups to find the total number of objects in a set.</p> <p>References: Mathematical Thinking in Kindergarten Investigation 2: Teacher Note, page 36 Collecting, Counting, and Measuring Investigation 1: Teacher Note, page 16 Counting Ourselves and Others Investigation 1 Teacher Note, page 12 Activity, pages 19-23 Teacher Note, page 34 Dialogue Box, page 35</p> <p>How Many in All? Investigation 1: Teacher Note, page 26</p> |
| <p>3. uses repeated subtraction (division) with whole numbers when given the total number of concrete objects in each group to find the number of groups (2.4.K1a), e.g., there are 9 pencils. If each student gets 2 pencils, how many students get pencils? $9 - 2 - 2 - 2 - 2$ or 9 minus 2 four times means four students get 2 pencils each and there is 1 pencil left over. or There are eight cookies to be shared equally among four people, how many cookies will each person receive?</p> | <p>Kindergarten students gain experience with preliminary concepts of division as they fill shapes with pattern blocks.</p> <p>References: Making Shapes and Building Blocks Investigation 4: Choice Time: Fill the Hexagons</p> |

Standard 2: Algebra – The student uses algebraic concepts and procedures in a variety of situations.

Benchmark 1: Patterns – The student recognizes, describes, extends, develops, and explains relationships in patterns using concrete objects in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>The student...</p> <p>1. uses concrete objects, drawings, and other representations to work with types of patterns (2.4.K1a):</p> <p>a. repeating patterns, e.g., an AB pattern is like red-blue, red-blue, ...; an ABC pattern is like dog-horse-pig, dog-horse-pig, ...; or an AAB pattern is like Δ-Δ-O, Δ-Δ-O, ...;</p> | <p>Pattern Trains and Hopscotch Paths Investigations 1, 2, 3, 4 <i>All Units: Appendix: About Classroom Routines: Patterns on the Pocket Chart</i></p> |
| <p>b. growing (extending) patterns, e.g., 5, 6, 7, ... is an example of a pattern that adds one to the previous number to continue the pattern.</p> | <p>Pattern Trains and Hopscotch Paths Investigation 4: Choice Time: Staircase Patterns, pages 78-79 <i>All Units: Appendix: About Classroom Routines: Calendar</i></p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|--|---|
| <p>2. uses these attributes to generate patterns:</p> <p>a. whole numbers (2.4.K1a), e.g., 2, 4, 6, ...;</p> | <p>Mathematical Thinking in Kindergarten Investigation 2: Teacher Note, page 36</p> <p>Collecting, Counting, and Measuring Investigation 1: Teacher Note, page 16</p> <p>Counting Ourselves and Others Investigation 1 Teacher Note, page 12 Activity, pages 19-23 Teacher Note, page 34 Dialogue Box, page 35</p> <p>How Many in All? Investigation 1: Teacher Note, page 26</p> <p><i>All Units: Appendix: About Classroom Routines: Calendar</i></p> |
| <p>b. geometric shapes with one attribute change (2.4.K1e), e.g., Δ, O, Δ, O, Δ, O, ...;</p> | <p>Pattern Trains and Hopscotch Paths Investigations 1, 2, 3, 4</p> <p><i>All Units: Appendix: About Classroom Routines: Patterns on the Pocket Chart</i></p> |
| <p>c. things related to daily life (2.4.K1a), e.g., breakfast, lunch, and dinner.</p> | <p>Mathematical Thinking in Kindergarten Investigation 3</p> <p>Pattern Trains and Hopscotch Paths Investigation 1</p> <p><i>All Units: Appendix: About Classroom Routines: Calendar</i></p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|--|---|
| <p>3. identifies and continues a pattern presented in various formats including numeric (list or table), visual (picture, table, or graph), verbal (oral description), and kinesthetic (action) (2.4.K1a) (\$).</p> | <p>Mathematical Thinking in Kindergarten Investigation 3 Pattern Trains and Hopscotch Paths Investigations 1, 2, 3, 4 <i>All Units: Appendix: About Classroom Routines: Calendar and Patterns on the Pocket Chart</i></p> |
| <p>4. generates (2.4.K1a): a. repeating patterns for the AB pattern, the ABC pattern, and the AAB pattern;</p> | <p>Pattern Trains and Hopscotch Paths Investigations 1, 2, 3, 4 <i>All Units: Appendix: About Classroom Routines: Patterns on the Pocket Chart</i></p> |
| <p>b. growing (extending) patterns that add 1, 2, or 10 to continue the pattern.</p> | <p>Mathematical Thinking in Kindergarten Investigation 3 Pattern Trains and Hopscotch Paths Investigation 4: Choice Time Staircase Patterns, pages 78-79 <i>All Units: Appendix: About Classroom Routines: Calendar</i></p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|--|--|
| <p>5. classifies and sorts concrete objects by similar attributes (2.4.K1a) (\$).</p> | <p>Mathematical Thinking in Kindergarten Investigation 1: Choice Time: Exploring Color Tiles, Pattern Blocks, Geoblocks Teacher Note: Talking About Pattern Blocks and Geoblocks, page 22 Investigation 3: Choice Time: Exploring Interlocking Cubes Investigation 4: Teacher Note, pages 61-64 Collecting, Counting, and Measuring Investigation 3: Choice Time: Measuring Table Investigation 4: Choice Time: Comparing Names, pages 60-61 Investigation 6 Counting Ourselves and Others Investigation 1 Choice Time: Self-Portraits, pages 25-27 Choice Time: Pattern Block Grab, pages 30-32 Investigation 2 Making Shapes and Building Blocks Investigation 1: Choice Time: Book of Shapes, pages 12-13 Investigation 3 Investigation 5</p> |

Benchmark 2: Variables, Equations, and Inequalities – The student solves addition equations using concrete objects in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>The student...</p> <p>1. finds the unknown sum using the basic facts with sums through 10 using concrete objects and pictures (2.4.K1a) (\$), e.g., 5 marbles + 5 marbles = √.</p> | <p>Collecting, Counting, and Measuring Investigation 4: Choice Time: Collect 10 Together How Many in All? Investigations 2-4</p> |

Benchmark 3: Functions – The student recognizes and describes whole number relationships using concrete objects in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|---|
| <p>The student...</p> <p>1. locates whole numbers from 0 through 20 on a number line (2.4.K1a).</p> | <p>Students use a modified number line to record the number of items in the Counting Jar and other data sets. References: Mathematical Thinking in Kindergarten Investigation 2 Counting Ourselves and Others Investigation 1: Focus Time, page 4 Investigation 3: Teacher Note, page 70</p> |

Benchmark 4: Models – The student uses mathematical models including concrete objects to represent, show, and communicate mathematical relationships in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|--|--|
| <p>The student...</p> <p>1. knows, explains, and uses mathematical models to represent mathematical concepts, procedures, and relationships. Mathematical models include:</p> <p>a. process models (concrete objects, pictures, number lines, unifix cubes, measurement tools, or calendars) to model computational procedures and mathematical relationships, to compare and order numerical quantities, and to represent fractional parts (1.1.K1-4, 1.2.K3-5, 1.3.K1, 1.4.K1-3, 2.1.K1, 2.1.K2a, 2.1.K2c, 2.1.K3-5, 2.2.K1, 2.3.K1, 3.1.K2, 3.2.K1-3, 3.3.K1-2, 3.4.K1-2) (\$);</p> | <p>Students use process models throughout the course. They use an extensive array of manipulatives, including interlocking cubes, dot cubes, number cubes, color tiles, pattern blocks, geoblocks, containers, countable objects, clothespins, and teddy bear counters. Students use pictures to justify and explain solutions to problems, and they use calendars to develop a sense of time and to keep track of time and events.</p> <p>Sample References:</p> <p>Mathematical Thinking in Kindergarten Investigation 3</p> <p>Pattern Trains and Hopscotch Paths Investigation 1</p> <p>Collecting, Counting, and Measuring Investigation 3</p> <p>Counting Ourselves and Others Investigation 2</p> <p>Making Shapes and Building Blocks Investigation 3</p> <p>How Many in All? Investigation 1</p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>b. place value models (ten frames, unifix cubes, bundles of straws, or base ten blocks) to represent numerical quantities (1.2.K2) (\$);</p> | <p>Mathematical Thinking in Kindergarten Investigations 1, 3 Collecting, Counting, and Measuring Investigations 3, 4, 5 Counting Ourselves and Others Investigations 1 How Many in All? Investigations 1, 2, 3, 4</p> |
| <p>c. fraction models (fraction strips or pattern blocks) to represent numerical quantities (1.1.K3) (\$);</p> | <p>How Many in All? Investigation 1</p> |
| <p>d. money models (base ten blocks or coins) to represent numerical quantities (1.1.K5) (\$);</p> | <p>Counting Ourselves and Others Investigation 2: Choice Time: page 50</p> |
| <p>e. two-dimensional geometric models (geoboards, dot paper, or attribute blocks), three-dimensional geometric models (solids), and real-world objects to compare size and to model attributes of geometric shapes (2.1.K1a, 3.1.K3);</p> | <p>Mathematical Thinking in Kindergarten Investigation 1 Choice Time: Exploring Pattern Blocks, Exploring Geoblocks Teacher Note, page 22 Dialogue Box, page 23 Making Shapes and Building Blocks Investigations 1, 2, 3, 4, 5 <i>Shapes</i> Teacher Tutorial, pages 117-154</p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>f. two-dimensional geometric models (spinners), three-dimensional geometric models (number cubes), and concrete objects to model probability (4.1.K1-2) (\$);</p> | <p>Students are introduced to the concepts of probability in Grade 3. Kindergarten students may predict future events based on collected data, e.g., whether or not all of their sunflower seeds will germinate. Some Choice Time Activities involve the use of dot or number cubes as a precursor to introducing concepts of probability later in the series.</p> <p>References: Pattern Trains and Hopscotch Paths Investigation 2 Choice Time: Add On, pages 36-37 Collecting, Counting, and Measuring Investigation 4 Choice Time: Collect 10 Together, pages 64-65 Counting Ourselves and Others Investigation 3 Dialogue Box, pages 74-75 How Many In All?: Investigation 1 Choice Time: Collect 15 Together, pages 17-19</p> |
| <p>g. graphs using concrete objects, pictographs, and frequency tables to organize and display data (4.2.K1-3) (\$).</p> | <p>Mathematical Thinking in Kindergarten Investigation 1 Counting Ourselves and Others Investigations 1, 2, 3 <i>All Units: Appendix: About Classroom Routines: Attendance, Today's Question</i></p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>2. uses concrete objects, pictures, drawings, diagrams, or dramatizations to show the relationship between two or more things (\$).</p> | <p>Students use cubes, color tiles, and calendars to show relationships between elements in patterns. They represent quantities with pictures and numerals as they develop counting strategies and relate numerals to the quantities they represent. They look at the relationships between different representations of the same set of data. They examine spatial relationships. They relate combinations of numbers and arrangements of objects.</p> <p>Sample References: Mathematical Thinking in Kindergarten Investigation 1 Pattern Trains and Hopscotch Paths Investigation 1 Collecting, Counting, and Measuring Investigation 1 Counting Ourselves and Others Investigation 1 Making Shapes and Building Blocks Investigation 4 How Many in All? Investigation 2</p> |

Standard 3: Geometry – The student uses geometric concepts and procedures in a variety of situations.

Benchmark 1: Geometric Figures and Their Properties – The student recognizes geometric shapes and their attributes using concrete objects in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>The student...</p> <p>1. recognizes circles, squares, rectangles, triangles, and ellipses (ovals) (plane figures/ two-dimensional figures) (2.4.K1e).</p> | <p>Mathematical Thinking in Kindergarten Investigation 1: Choice Time: Exploring Pattern Blocks Making Shapes and Building Blocks Investigations 1-5 <i>Shapes</i> Teacher Tutorial, pages 117-154</p> |
| <p>2. recognizes and investigates attributes of circles, squares, rectangles, triangles, and ellipses using concrete objects, drawings, and/or appropriate technology (2.4.K1a,e).</p> | <p>Mathematical Thinking in Kindergarten Investigation 1: Choice Time: Exploring Pattern Blocks Making Shapes and Building Blocks Investigations 1-5 <i>Shapes</i> Teacher Tutorial, pages 117-154</p> |
| <p>3. sorts cubes, rectangular prisms, cylinders, cones, and spheres (solids/three-dimensional figures) by their attributes using concrete objects (2.4.K1e).</p> | <p>Mathematical Thinking in Kindergarten Investigation 1 Choice Time: Exploring Geoblocks Teacher Note, page 22 Making Shapes and Building Blocks Investigations 3-5</p> |

Benchmark 2: Measurement and Estimation – The student estimates and measures using standard and nonstandard units of measure with concrete objects in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>The student...</p> <p>1. uses whole number approximations (estimations) for length using nonstandard units of measure (2.4.K1a) (\$), e.g., the classroom door is about two kindergartners high or this paper is about two pencils long.</p> | <p>Collecting, Counting, and Measuring Investigations 3, 4 Investigation 5: Dialogue Box, pp. 76-77 How Many In All? Investigation 1</p> |
| <p>2. compares two measurements using these attributes (2.4.K1a) (\$):</p> <p>a. longer, shorter (length);</p> | <p>Collecting, Counting, and Measuring Investigations 3, 4 Investigation 5: Dialogue Box, pp. 76-77 How Many In All? Investigation 1</p> |
| <p>b. taller, shorter (height);</p> | <p>Collecting, Counting, and Measuring Investigations 3 Investigation 5: Dialogue Box, pp. 76-77</p> |
| <p>c. heavier, lighter (weight).</p> | <p>Students using the series <i>Investigations in Number, Data, and Space</i> explore the concept of weight comparison beginning in Grade 1.</p> |
| <p>d. hotter, colder (temperature).</p> | <p>Collecting, Counting, and Measuring Investigations 1, Focus Time Follow Up, page 9</p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|--|---|
| <p>3. reads and tells time at the hour using analog and digital clocks (2.4.K1a).</p> | <p>Kindergarten students develop a sense of time in days and weeks.</p> <p>References: Mathematical Thinking in Kindergarten Investigation 3 <i>All units: Appendix: About Classroom Routines: Calendar</i></p> |

Benchmark 3: Transformational Geometry – The student develops the foundation for spatial sense using concrete objects in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>The student...</p> <p>1. describes the spatial relationship between two concrete objects using appropriate vocabulary (2.4.K1a), e.g., behind, above, below, on, or under.</p> | <p>In addition to physical manipulation of shapes and objects, Kindergarten students describe, name, and interpret relative positions in space through the use of <i>Shapes</i>, a software program which allows students to construct and manipulate geometric shapes, see objects move according to rules they specify, and explore rotation and reflection.</p> <p>References: Making Shapes and Building Blocks Investigations 2, 3, 4 <i>Shapes Teacher Tutorial: pages 117-154</i></p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|--|--|
| <p>2. identifies two like objects or shapes from a set of four objects or shapes (2.4.K1a).</p> | <p>Mathematical Thinking in Kindergarten Investigation 1 Choice Time: Exploring Color Tiles, Pattern Blocks, Geoblocks Investigation 3 Choice Time: Exploring Interlocking Cubes Investigation 4: Teacher Note, pages 61-64 Collecting, Counting, and Measuring Investigation 3: Choice Time: Measuring Table Investigation 4 Choice Time: Comparing Names Choice Time: Grab and Count: Compare Investigation 5 Investigation 6: Focus Time: Six Tiles Counting Ourselves and Others Investigation 1 Choice Time: Self-Portraits Choice Time: Pattern Block Grab Investigation 2 Focus Time: What Did You Eat for Lunch? Making Shapes and Building Blocks Investigation 1: Choice Time: Book of Shapes Investigation 3 Focus Time: 3-D Shapes in the Classroom Choice Time: Shape Hunt Choice Time: Exploring Geoblocks Investigation 4: Focus Time: Clay Shapes Investigation 5: Focus Time: A Close Look at Geoblocks</p> |

Benchmark 4: Geometry From An Algebraic Perspective – The student identifies one or more points on a number line in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|---|
| <p>The student...</p> <p>1. locates and plots whole numbers from 0 through 20 on a horizontal number line (2.4.K1a).</p> | <p>Students use a modified number line to record the number of items in the Counting Jar and other data sets.</p> <p>References: Mathematical Thinking in Kindergarten Investigation 2: Focus Time: Counting Jar Counting Ourselves and Others Investigation 1: Focus Time, page 4 Investigation 3: Teacher Note, page 70 How Many in All? Investigation 3: Choice Time: Racing Bears <i>All Units: About Classroom Routines: Attendance</i></p> |
| <p>2. counts forwards and backwards from a given whole number from 0 through 10 on a number line (2.4.K1a).</p> | <p>Students use a modified number line to record the number of items in the Counting Jar and other data sets.</p> <p>References: Mathematical Thinking in Kindergarten Investigation 2: Focus Time: Counting Jar Pattern Trains and Hopscotch Paths Investigation 4: Choice Time: Staircase Patterns Counting Ourselves and Others Investigation 1: Focus Time, page 4 Investigation 3: Teacher Note, page 70 How Many in All? Investigation 3: Choice Time: Racing Bears <i>All Units: About Classroom Routines: Attendance, Calendar</i></p> |

Standard 4: Data – The student uses concepts and procedures of data analysis in a variety of situations.

Benchmark 1: Probability – The student applies the concepts of probability using concrete objects in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|--|--|
| <p>The student...</p> <p>1. recognizes whether an event is impossible or possible (2.4.K1f) (\$), e.g., the possibility of a person having ten heads is impossible, while the possibility of a person having red hair is possible.</p> | <p>Students are introduced to the concepts of probability in Grade 3. Kindergarten students may predict future events based on collected data, e.g., whether or not all of their sunflower seeds will germinate. Some Choice Time Activities involve the use of dot or number cubes as a precursor to introducing concepts of probability later in the series.</p> <p>References: Pattern Trains and Hopscotch Paths Investigation 2: Choice Time: Add On, pages 36-37 Collecting, Counting, and Measuring Investigation 4 Choice Time: Collect 10 Together, pages 64-65 Counting Ourselves and Others Investigation 3: Dialogue Box, pages 74-75 How Many In All?: Investigation 1 Choice Time: Collect 15 Together, pages 17-19</p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|--|---|
| <p>2. recognizes and states whether a simple event in an experiment or simulation including the use of concrete objects can have more than one outcome (2.4.K1a,f).</p> | <p>References: Pattern Trains and Hopscotch Paths Investigation 2: Choice Time: Add On, pages 36-37 Collecting, Counting, and Measuring Investigation 4 Choice Time: Collect 10 Together, pages 64-65 Counting Ourselves and Others Investigation 3: Dialogue Box, pages 74-75 How Many In All?: Investigation 1 Choice Time: Collect 15 Together, pages 17-19</p> |

Benchmark 2: Statistics – The student collects, records, and explains numerical (whole numbers) and non-numerical data sets including the use of concrete objects in a variety of situations.

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>The student...</p> <p>1. records numerical (quantitative) and non-numerical (qualitative) data including concrete objects, graphs, and tables using these data displays (2.4.K1a,g) (\$):</p> <p>a. graphs using concrete objects,</p> | <p>References: Counting Ourselves and Others Investigation 3: Focus Time, pages 58-60 Investigation 3: Teacher Note, page 70 <i>All Units: About Classroom Routines: Today's Question</i></p> |
| <p>b. pictographs with a whole symbol or picture representing one (no partial symbols or pictures),</p> | <p>References: Counting Ourselves and Others Investigation 3: Focus Time, pages 58-60 Investigation 3: Teacher Note, page 70 <i>All Units: About Classroom Routines: Today's Question</i></p> |
| <p>c. frequency tables (tally marks).</p> | <p>Mathematical Thinking in Kindergarten Investigation 4 Counting Ourselves and Others Investigations 1, 2, 3 <i>All Units: Appendix: About Classroom Routines: Attendance, Today's Question</i></p> |

| Kindergarten Knowledge Base Indicators | Investigations in Number, Data, and Space |
|---|--|
| <p>2. collects data related to familiar everyday experiences by counting and tallying (2.4.K1a,g) (\$).</p> | <p>Mathematical Thinking in Kindergarten Investigations 1, 4 Counting Ourselves and Others Investigations 1-4 <i>All Units: Appendix: About Classroom Routines: Today's Question, Attendance</i></p> |
| <p>3. determines the mode (most) after sorting by one attribute (2.4.K1a,g) (\$), e.g., color, shape, or size.</p> | <p>Mathematical Thinking in Kindergarten Investigation 1 Collecting, Counting, and Measuring Investigation 3 Counting Ourselves and Others Investigations 1, 2, 3</p> |