

A Correlation of



to the

Virginia

**Department of Education
Standards of Learning
Grades K-5**



T/M-143A

Introduction

This document demonstrates how *Investigations in Number, Data, and Space*[®] supports the Virginia Department of Education Standards of Learning. The citations within this correlation provide Investigation Curriculum Unit titles, followed by the Investigation number and Session number or Focus Time/Choice Time title. Additional citations to Classroom Routines may be included.

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

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Mathematics Standards	Correlation By Page Numbers Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.
Number and Number Sense K.1 The student, given two sets containing 10 or fewer concrete items, will identify and describe one set as having more, fewer, or the same number of members as the other set, using the concept of one-to-one correspondence.	References: Mathematical Thinking in Kindergarten Investigation 4 Collecting, Counting, and Measuring Investigation 3: Choice Time: Compare, pages 46-47 Investigation 4 Choice Time: Grab and Count: Compare, pages 62-63 Investigation 5 How Many in All? Investigation 2: Choice Time: Grab Two Handfuls
K.2 The student, given a set containing 10 or fewer concrete items, will a) tell how many are in the set by counting the number of items orally;	References: Mathematical Thinking in Kindergarten Investigation 2 Collecting, Counting, and Measuring Investigation 1 Investigation 2 Investigation 4 Counting Ourselves and Others Investigation 1

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<p>b) select the corresponding numeral from a given set; and</p> <p>c) write the numeral to tell how many are in the set.</p>	<p>References: Mathematical Thinking in Kindergarten Investigation 2 Collecting, Counting, and Measuring Investigation 1 Investigation 2 Investigation 4 Counting Ourselves and Others Investigation 1</p> <p>References: Mathematical Thinking in Kindergarten Investigation 2 Collecting, Counting, and Measuring Investigation 1 Investigation 2 Investigation 4 Counting Ourselves and Others Investigation 1</p>

Mathematics Standards	Correlation By Page Numbers
<p>K.3 The student, given an ordered set of three objects and/or pictures, will indicate the ordinal position of each item, first through third, and the ordered position of each item from left-to-right, right-to-left, top-to-bottom, and/or bottom-to-top.</p>	<p>References: Mathematical Thinking in Kindergarten Investigation 2: Teacher Note, page 36 Investigation 3: page 45 Collecting, Counting, and Measuring Investigation 1: Teacher Note, page 16 Counting Ourselves and Others Investigation 1: Teacher Note, page 12</p>
<p>K.4 The student will investigate and recognize patterns from counting by fives and tens to 30, using concrete objects and a calculator.</p>	<p>References: Mathematical Thinking in Kindergarten Investigation 2: Teacher Note, page 36 Counting Ourselves and Others Investigation 1 Activity, pages 19-23 Teacher Note, page 34 Dialogue Box, page 35 How Many in All? Investigation 1: Teacher Note, page 26</p>

Mathematics Standards	Correlation By Page Numbers
<p>Number and Number Sense, continued</p> <p>K.5 The student will count forward to 30 and backward from 10.</p>	<p>References: Mathematical Thinking in Kindergarten Investigation 1 Collecting, Counting, and Measuring Investigation 1 Investigation 2 Counting Ourselves and Others Investigation 1 Investigation 4</p>
<p>Computation and Estimation</p> <p>K.6 The student will add subtract whole numbers, using up to 10 concrete items.</p>	<p>References: Collecting, Counting, and Measuring Investigation 4: Choice Time: Collect 10 Together How Many in All? Investigation 1: Choice Time: Collect 15 Together Investigation 2 Investigation 3 Investigation 4</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>Measurement</p> <p>K.7 The student will recognize a penny, nickel, dime, and quarter and will determine the value of a collection of pennies and/or nickels whose total value is 10 cents or less.</p>	<p>Reference: Counting Ourselves and Others Investigation 2: Choice Time: page 50</p>
<p>K.8 The student will identify the instruments used to measure length (ruler), weight (scale), time (clock: digital and analog; calendar: day, month, and season), and temperature (thermometer).</p>	<p>References: Mathematical Thinking in Kindergarten Investigation 3 Collecting, Counting, and Measuring Investigation 3: Focus Time Measurement Towers, pages 38-41 Investigation 4: Choice Time Comparing Names, pages 60-61 Investigation 5: Dialogue Box Comparing and Ordering Towers, pages 76-77 How Many in All? Investigation 1</p>

Mathematics Standards	Correlation By Page Numbers
K.9 The student will tell time to the hour, using an analog or digital clock.	Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard. Kindergarten students using <i>Investigations in Number, Data, and Space</i> develop a sense of time in days and weeks. References: Mathematical Thinking in Kindergarten Investigation 3 <i>All units: Appendix: About Classroom Routines: Calendar</i>
K.10 The student will compare two objects or events, using direct comparisons or nonstandard units of measure, according to one or more of the following attributes: length (shorter, longer), height (taller, shorter), weight (heavier, lighter), temperature (hotter, colder). Examples of nonstandard units include foot length, hand span, new pencil, paper clip, block.	References: Mathematical Thinking in Kindergarten Investigation 1 Teacher Note, page 22 Collecting, Counting, and Measuring Investigation 1: Focus Time Follow-Up: Extensions Seasons, page 9 Investigation 3 Investigation 4 Investigation 5: Dialogue Box, pages 76-77

Mathematics Standards	Correlation By Page Numbers
<p>Geometry</p> <p>K.11 The student will identify, describe, and draw two-dimensional (plane) geometric figures (circle, triangle, square, and rectangle).</p>	<p>References: Mathematical Thinking in Kindergarten Investigation 1 Choice Time: Exploring Pattern Blocks, pages 14-15 Making Shapes and Building Blocks Investigation 1 Investigation 2 Investigation 5 <i>Shapes</i> Teacher Tutorial, pages 117-154</p>
<p>K.12 The student will describe the location of one object relative to another (above, below, next to) and identify representations of plane geometric figures (circle, triangle, square, and rectangle) regardless of their position and orientation in space.</p>	<p>In addition to physical manipulation of shapes and objects, Kindergarten students using <i>Investigations in Number, Data, and Space</i> 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 Investigation 1 Investigation 2</p>

Mathematics Standards	Correlation By Page Numbers
(continued)	Investigation 3: Dialogue Box Solving Computer Puzzles, pages 58-59 Investigation 5 Shapes Teacher Tutorial: pages 117-154
K.13 The student will compare the size (larger, smaller) and shape of plane geometric figures (circle, triangle, square, and rectangle).	References: Mathematical Thinking in Kindergarten Investigation 1: Teacher Note, page 22 Collecting, Counting, and Measuring Investigation 3 Counting Ourselves and Others Investigation 1: Choice Time Pattern Block Grab, pages 30-32 Making Shapes and Building Blocks Investigation 1 Investigation 2

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<p>Probability and Statistics</p> <p>K.14 The student will gather data relating to familiar experiences by counting and tallying.</p>	<p>References: Mathematical Thinking in Kindergarten Investigation 1 Investigation 4 Counting Ourselves and Others Investigation 2 Investigation 3 Investigation 4</p>
<p>K.15 The student will display objects and information, using objects graphs, pictorial graphs, and tables.</p>	<p>References: Mathematical Thinking in Kindergarten Investigation 1 Investigation 4 Counting Ourselves and Others Investigation 1 Investigation 2 Investigation 3</p>

Mathematics Standards	Correlation By Page Numbers
<p>K.16 The student will investigate and describe the results of dropping a two-colored counter or using a multicolored spinner.</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>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>Patterns, Functions, and Algebra</p> <p>K.17 The student will sort and classify objects according to similar attributes (size, shape, and color).</p>	<p>References: Mathematical Thinking in Kindergarten Investigation 1: Teacher Note, page 22 Collecting, Counting, and Measuring Investigation 3: Focus Time Follow-Up: Extensions A Longer/Shorter Hunt, page 41 Counting Ourselves and Others Investigation 1: Choice Time: Self-Portraits, pages 25-27 Investigation 2: Choice Time: Clothing Sort, pages 51-52 Making Shapes and Building Blocks Investigation 1</p>
<p>K.18 The student will identify, describe, and extend a repeating relationship (pattern) found in common objects, sounds, and movements.</p>	<p>References: Pattern Trains and Hopscotch Paths Investigation 1 Investigation 2 Investigation 3 Investigation 4 <i>All Units: Appendix: About Classroom Routines: Patterns on the Pocket Chart</i></p>

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<p>1. Materials emphasize the use of effective instructional practices and learning theory:</p> <ul style="list-style-type: none"> • Students are guided through problem-solving approaches. • Concepts are introduced through concrete experiences that use manipulatives and other technologies. • Multiple opportunities are provided for students to develop and apply concepts through the use of calculators, computers, and other technologies. 	<p>Kindergarten students using <i>Investigations in Number, Data, and Space</i> are guided through the problem-solving process on a daily basis as they conduct the investigations into which the curriculum is organized.</p> <p>Kindergarten students using <i>Investigations in Number, Data, and Space</i> use a variety of concrete manipulatives throughout the course, including color tiles, pattern blocks, Geoblocks, interlocking cubes, dot cubes, number cubes, and objects to be measured.</p> <p>Kindergarten students using <i>Investigations in Number, Data, and Space</i> use <i>Shapes</i> computer software to explore symmetry, pattern, rotation, reflection, area, and other characteristics of two-dimensional shapes. Calculators are used and should be available throughout Investigations activities to develop and apply concepts. Teacher Notes discussing this important mathematical tool are found in an early unit at each grade level.</p>

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<ul style="list-style-type: none"> • Students use the language of mathematics including specialized vocabulary and symbols. • Students use a variety of representations (graphical, numerical, symbolic, verbal, and physical) to connect mathematical concepts. 	<p>Kindergarten students using <i>Investigations of Number, Data, and Space</i> use mathematical language as they solve problems throughout the course. The Dialogue Box feature, integrated throughout the curriculum, illustrates the development of mathematical language through teacher-student guidance and student-student discussion. Students progress through the curriculum by completing investigations, which consist of multiple cooperative learning activities. These explorations entail a great deal of group discussion and communication. For example, students describe patterns, collect data about their classmates, and solve story problems. They use mathematical notation to write number sentences.</p> <p>Each unit of study in <i>Investigations in Number, Data, and Space</i> is organized to enable students to connect mathematical concepts. For example, in <i>How Many Are We? (Counting Ourselves and Others: Investigation 1)</i>, students create a variety of representations of the same data, and then compare their representations. In <i>2-D Faces on 3-D Blocks (Making Shapes and Building Blocks: Investigation 5)</i>, students connect three-</p>

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<p>(continued)</p>	<p>dimensional solids by matching their two-dimensional faces. In Counting and Measuring (How Many In All: Investigation 1), students relate the concepts of using numbers to count objects and using numbers to represent lengths of objects.</p>
<p>2. Materials present content in an accurate, unbiased manner:</p> <ul style="list-style-type: none"> • Materials are relatively free of content and production errors (misspelled words, word omissions, incorrect answers). • Diverse groups (racial, ethnic, cultural, linguistic), males and females, people with disabilities, and people of all ages are represented appropriately. 	<p><i>Investigations in Number, Data, and Space</i> has copyrights and updates for 1998, and 2004. Misspelled words, word omissions, incorrect answers, etc. have been addressed and corrections made in these updates.</p> <p>The investigations are carefully designed to invite all students into mathematics – girls and boys, members of diverse cultural, ethnic, and language groups, and students with different strengths and interests. Problem contexts call on students to share experiences from their family, culture or community. The curriculum eliminates barriers that exclude some students from participating successfully in mathematics.</p>

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<p>3. The mathematics content is significant and accurate:</p> <ul style="list-style-type: none"> • Materials are presented in an organized, logical manner which represents the current thinking on how students learn mathematics. • Materials are organized appropriately within and among units of study. • Format design includes titles, subheadings, and appropriate cross-referencing for ease of use. • Writing style, length of sentences, vocabulary, graphics, and illustrations are appropriate. 	<p>The TERC authors created this curriculum based on their own research of how children think about and best learn mathematics. The materials were field-tested 2-3 years to assure efficacy.</p> <p>Each Curriculum Unit has a content focus and is comprised of a set of Investigations. Each Investigation is comprised of a carefully sequenced set of activities to develop students' mathematical thinking.</p> <p>The narrative lesson plan of each Investigation and each daily Class Session follow the same format K-5. What Happens and Mathematical Emphases, Activities, Class Discussions, Homework and Follow-Up are clearly labeled for ease of use.</p> <p>The text reading required by the student is minimized so as to focus attention on the mathematics. Any graphics and illustrations are provided to support the work of the student in the investigation.</p>

Other Criteria	Correlation By Page Numbers
<ul style="list-style-type: none"> • Level of abstraction is appropriate, and real life examples, including careers, are provided. • Sufficient applications are provided to promote depth of application. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>The Investigations curriculum moves students appropriately from the concrete to representational to symbolic notation throughout the work of an investigation. Many investigations begin with a question about a real-world situation to solve.</p> <p>Each Curriculum Unit has a content focus for instruction and learning. Students may spend 2-7 weeks of inquiry, learning, practice and application of skills and understandings of mathematical ideas in the unit.</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>Number and Number Sense</p> <p>1.1 The student will count objects in a given set containing between 1 and 100 objects and write the corresponding numeral.</p>	<p>References: Mathematical Thinking at Grade 1 Investigation 2: Sessions 1-6 Investigation 4: Sessions 1-6 Building Number Sense Investigation 2: Sessions 1-9 Number Games and Story Problems Investigation 2: Sessions 1-13 <i>All Units: Appendix: About Classroom Routines: Counting</i></p>
<p>1.2 The student will group a collection of up to 100 objects into tens and ones and write the corresponding numeral to develop an understanding of place value.</p>	<p>References: Building Number Sense Investigation 2: Session 2 Investigation 3 Sessions 1-2 Session 9 Number Games and Story Problems Investigation 2 Sessions 6-8 Sessions 10-12</p>

Mathematics Standards	Correlation By Page Numbers
1.3 The student will count forward by ones, fives, and tens to 100, by twos to 20, and backward by ones from 20.	<p>References: Mathematical Thinking at Grade 1 Investigation 4: Sessions 1-6 Building Number Sense Investigation 1: Session 2: Teacher Note, pages 11-12 Investigation 3: Session 9 Number Games and Story Problems Investigation 2: Sessions 6-12 <i>All Units: About Classroom Routines: Counting</i></p>
1.4 The student will recognize and write numerals 0 through 100.	<p>References: Mathematical Thinking in Grade 1 Investigation 2: Sessions 1-6 Investigation 4: Sessions 2-6 Building Number Sense Investigation 2: Sessions 1-9 Investigation 4: Sessions 1-10 Number Games and Story Problems Investigation 1: Sessions 1-10</p>

Mathematics Standards	Correlation By Page Numbers
1.5 The student will identify the ordinal positions first through tenth, using an ordered set of objects.	Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard. Students order numbers by building staircases of interlocking cubes and order family data according to age. References: Mathematical Thinking at Grade 1 Investigation 2: Sessions 2-3 Survey Questions and Secret Rules Investigation 4: Sessions 2-3
1.6 The student will identify and represent the concepts of one-half and one-fourth, using appropriate materials or a drawing.	References: Bigger, Taller, Heavier, Smaller Investigation 2: Sessions 2-4 Investigation 3: Session 2

Mathematics Standards	Correlation By Page Numbers
<p>Computation and Estimation</p> <p>1.7 The student, given a familiar problem situation involving magnitude, will</p> <ul style="list-style-type: none"> a) select a reasonable magnitude from three given quantities: a one-digit numeral, a two-digit numeral, and a three-digit numeral (e.g., 5, 50, and 500); and b) explain the reasonableness of his/her choice. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Building Number Sense Investigation 3 Sessions 3-4: Choice 4: Exploring Calculators, pages 95-96 Session 9, page 110</p> <p>References: Mathematical Thinking at Grade 1 Investigation 4: Session 4: Activity: Sharing Solution Methods, pages 95-96</p> <p>Building Number Sense Investigation 2: Sessions 4-5: Dialogue Box, page 67 Investigation 3: Sessions 3-4: Choice 4: Exploring Calculators, pages 95-96 Investigation 3: Session 9, page 110</p> <p>Number Games and Story Problems Investigation 3: Sessions 1-2</p>

Mathematics Standards	Correlation By Page Numbers
<p>1.8 The student will recall basic addition facts — i.e., sums to 10 or less — and the corresponding subtraction facts.</p>	<p>References: Mathematical Thinking in Grade 1 Investigation 2: Session 4 Investigation 4: Session 4 Building Number Sense Investigation 2: Sessions 1-9 Number Games and Story Problems Investigation 1: Sessions 1-10 Investigation 3: Sessions 1-13</p>
<p>1.9 The student will create and solve story and picture problems involving one-step solutions, using basic addition and subtraction facts.</p>	<p>References: Mathematical Thinking in Grade 1 Investigation 2: Session 4 Investigation 4: Session 6 Building Number Sense Investigation 4: Sessions 1-10 Number Games and Story Problems Investigation 1: Session 10 Investigation 3: Session 13</p>

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<p>Measurement</p> <p>1.10 The student will</p> <ul style="list-style-type: none"> a) identify the number of pennies equivalent to a nickel, a dime, and a quarter; and b) determine the value of a collection of pennies, nickels, and dimes whose total value is 100 cents or less. 	<p>References: Number Games and Story Problems Investigation 2 Session 3 Sessions 4-5: Choice Time: Collect 25¢ Together</p> <p>References: Number Games and Story Problems Investigation 2 Session 3 Sessions 4-5: Choice Time: Collect 25¢ Together</p>

Mathematics Standards	Correlation By Page Numbers
1.11 The student will tell time to the half-hour, using an analog or digital clock.	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Time concepts taught in the Grade 1 series of <i>Investigations in Number, Data, and Space</i> include calendar features: the cyclical nature of the sequence of months and dates, units of time and relationships among them, birthday data, and problem solving.</p> <p>References: Survey Questions and Secret Rules Investigation 3: Sessions 1-3 <i>All Units: About Classroom Routines: Understanding Time and Changes</i></p>
1.12 The student will use nonstandard units to measure length and weight.	<p>References: Bigger, Taller, Heavier, Smaller Investigation 1: Sessions 1-6 Investigation 3: Sessions 1-5</p>
1.13 The student will compare the volumes of two given containers by using concrete materials (e.g., jelly beans, sand, water, rice).	<p>References: Building Number Sense Investigation 3: Sessions 3-4 Bigger, Taller, Heavier, Smaller Investigation 2: Sessions 1-7</p>

Mathematics Standards	Correlation By Page Numbers
1.14 The student will compare the weights of two objects, using a balance scale.	<p>References: Bigger, Taller, Heavier, Smaller Investigation 1: Sessions 1-6</p>
<p>Geometry</p> <p>1.15 The student will describe the proximity of objects in space (<i>near, far, close by, below, above, up, down, beside, and next to</i>).</p>	<p>References: Building Number Sense Investigation 1: Sessions 3-4 Quilt Squares and Block Towns Investigation 1 Sessions 3-6 Sessions 8-10 Investigation 3: Sessions 6-7 Appendix: <i>Shapes</i> Teacher Tutorial</p>

Mathematics Standards	Correlation By Page Numbers
1.16 The student will draw, describe, and sort plane geometric figures (triangle, square, rectangle, and circle) according to number of sides, corners, and square corners.	<p>References: Mathematical Thinking in Grade 1 Investigation 1: Sessions 1-4 Building Number Sense Investigation 1: Sessions 5-6 Survey Questions and Secret Rules Investigation 1: Sessions 1-2 Quilt Squares and Block Towns Investigation 1: Sessions 1-15 Appendix: <i>Shapes</i> Teacher Tutorial</p>
1.17 The student will identify and describe objects in his/her environment that depict plane geometric figures (triangle, rectangle, square, and circle).	<p>References: Quilt Squares and Block Towns Investigation 1: Session 1 Investigation 3: Sessions 3-4</p>

Mathematics Standards	Correlation By Page Numbers
<p>Probability and Statistics</p> <p>1.18 The student will investigate, identify, and describe various forms of data collection in his/her world (e.g., recording daily temperature, lunch count, attendance, and favorite ice cream), using tables, picture graphs, and object graphs.</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Mathematical Thinking at Grade 1 Investigation 5: Sessions 1-6 Survey Questions and Secret Rules Investigation 2: Sessions 1-6 Investigation 3: Sessions 1-3 Investigation 4: Sessions 1-5 <i>All Units: About Classroom Routines: Exploring Data, Understanding Time and Changes</i></p>
<p>1.19 The student will interpret information displayed in a picture or object graph, using the vocabulary <i>more, less, fewer, greater than, less than, and equal to.</i></p>	<p>References: Mathematical Thinking at Grade 1 Investigation 5: Sessions 1-6 Survey Questions and Secret Rules Investigation 2: Sessions 5-6 Investigation 3: Sessions 1-2 Investigation 4: Sessions 2-3 <i>All Units: About Classroom Routines: Exploring Data</i></p>

Mathematics Standards	Correlation By Page Numbers
<p>Patterns, Functions, and Algebra</p> <p>1.20 The student will sort and classify concrete objects according to one or more attributes, including color, size, shape, and thickness.</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Survey Questions and Secret Rules Investigation 1: Sessions 1-6 Investigation 2: Sessions 3-4 Quilt Squares and Block Towns Investigation 1: Sessions 11-12 Investigation 2: Sessions 1-2 <i>All Units: About Classroom Routines: Exploring Data: Guess My Rule, Guess My Object</i></p>
<p>1.21 The student will recognize, describe, extend, and create a wide variety of patterns, including rhythmic, color, shape, and numerical. Patterns will include both growing and repeating patterns. Concrete materials and calculators will be used by students.</p>	<p>References: Mathematical Thinking at Grade 1 Investigation 3: Sessions 1-6 Building Number Sense Investigation 3: Session 8 Investigation 4: Session 10: Activity: Clapping Patterns, page 163 Quilt Squares and Block Towns Investigation 1: Sessions 13-15 Number Games and Story Problems Investigation 2: Session 9</p>

<p>Other Criteria</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>1. Materials emphasize the use of effective instructional practices and learning theory:</p> <ul style="list-style-type: none"> • Students are guided through problem-solving approaches. • Concepts are introduced through concrete experiences that use manipulatives and other technologies. • Multiple opportunities are provided for students to develop and apply concepts through the use of calculators, computers, and other technologies. 	<p>Grade 1 students using <i>Investigations in Number, Data, and Space</i> are guided through problem-solving approaches throughout the course as they carry out the investigations around which the curriculum is organized. For example, students employ a variety of approaches, including the use of drawings and symbols, to solve combining and separating story problems.</p> <p>Students use an extensive array of concrete manipulatives, including number cubes, dot cubes, square color tiles, hundred charts, balances, pattern blocks, buttons, coins, counters, attribute logic blocks, geoblocks, tetronimoes, and snap cubes to explore mathematical concepts.</p> <p>Students use <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. They use calculators to perform calculations and to explore number patterns. Calculators are used and should be available throughout Investigations activities to develop and apply concepts. Teacher Notes discussing this important mathematical tool are found in an early unit at each grade level.</p>

Other Criteria	Correlation By Page Numbers
<ul style="list-style-type: none"> • Students use the language of mathematics including specialized vocabulary and symbols. • Students use a variety of representations (graphical, numerical, symbolic, verbal, and physical) to connect mathematical concepts. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Grade 1 students using <i>Investigations in Number, Data, and Space</i> express ideas using mathematical language and notation throughout the course. The Dialogue Box is a feature that appears with many investigations and contains the text of discussions between teachers and students in which the teacher encourages students to use the language of mathematics to express mathematical ideas precisely. Students gain experience using mathematical notation, including the equal sign and symbols for addition and subtraction.</p> <p>Grade 1 students using <i>Investigations in Number, Data, and Space</i> analyze mathematical models and representations and use them to connect mathematical concepts throughout the course. Students construct physical models, draw pictures, and write and use symbolic representations of problem situations.</p>

Other Criteria	Correlation By Page Numbers
<p>2. Materials present content in an accurate, unbiased manner:</p> <ul style="list-style-type: none"> • Materials are relatively free of content and production errors (misspelled words, word omissions, incorrect answers). • Diverse groups (racial, ethnic, cultural, linguistic), males and females, people with disabilities, and people of all ages are represented appropriately. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p><i>Investigations in Number, Data, and Space</i> has copyrights and updates for 1998, and 2004. Misspelled words, word omissions, incorrect answers, etc. have been addressed and corrections made in these updates.</p> <p>The investigations are carefully designed to invite all students into mathematics – girls and boys, members of diverse cultural, ethnic, and language groups, and students with different strengths and interests. Problem contexts call on students to share experiences from their family, culture or community. The curriculum eliminates barriers that exclude some students from participating successfully in mathematics.</p>

<p>Other Criteria</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>3. The mathematics content is significant and accurate:</p> <ul style="list-style-type: none"> • Materials are presented in an organized, logical manner which represents the current thinking on how students learn mathematics. • Materials are organized appropriately within and among units of study. • Format design includes titles, subheadings, and appropriate cross-referencing for ease of use. • Writing style, length of sentences, vocabulary, graphics, and illustrations are appropriate. 	<p>The TERC authors created this curriculum based on their own research of how children think about and best learn mathematics. The materials were field-tested 2-3 years to assure efficacy.</p> <p>Each Curriculum Unit has a content focus and is comprised of a set of Investigations. Each Investigation is comprised of a carefully sequenced set of activities to develop students' mathematical thinking.</p> <p>The narrative lesson plan of each Investigation and each daily Class Session follow the same format K-5. What Happens and Mathematical Emphases, Activities, Class Discussions, Homework and Follow-Up are clearly labeled for ease of use.</p> <p>The text reading required by the student is minimized so as to focus attention on the mathematics. Any graphics and illustrations are provided to support the work of the student in the investigation.</p>

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<ul style="list-style-type: none"> • Level of abstraction is appropriate, and real life examples, including careers, are provided. • Sufficient applications are provided to promote depth of application. 	<p>The Investigations curriculum moves students appropriately from the concrete to representational to symbolic notation throughout the work of an investigation. Many investigations begin with a question about a real-world situation to solve.</p> <p>Each Curriculum Unit has a content focus for instruction and learning. Students may spend 2-7 weeks of inquiry, learning, practice and application of skills and understandings of mathematical ideas in the unit.</p>

Mathematics Standards	Correlation By Page Numbers Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.
Number and Number Sense 2.1 The student will a) read, write, and identify the place value of each digit in a three-digit numeral, using numeration models; and	Students explore place-value concepts as they construct and solve problems using a 100 chart. References: Coins, Coupons, and Combinations Investigation 4: Sessions 1-4 Putting Together and Taking Apart Investigation 2: Sessions 1-7 Investigation 4: Sessions 2-4 Investigation 5 Sessions 2-3 Session 6

Mathematics Standards	Correlation By Page Numbers
<p>b) round two-digit numbers to the nearest ten.</p>	<p>Students estimate solutions to computation problems to check the reasonableness of their results, and they estimate the total number of pockets worn by the children in the classroom on a particular day. They participate in an activity whose goal is to accumulate sums as close as possible to 20.</p> <p>References: Coins, Coupons, and Combinations Investigation 1 Session 7 Sessions 8-9: Choice 1: Close to 20, p. 41 Investigation 2: Session 10</p>
<p>2.2 The student will compare two whole numbers between 0 and 999, using symbols (>, <, or =) and words (<i>greater than, less than, or equal to</i>).</p>	<p>References: Mathematical Thinking at Grade 2 Investigation 4: Sessions 1, 5 Investigation 5: Session 3 Coins, Coupons, and Combinations Investigation 2: Session 10: Activity, pages 83-84 Investigation 3: Session 1: Activity, page 89 Putting Together and Taking Apart Investigation 1: Session 1: Teacher Note, page 11</p>

Mathematics Standards	Correlation By Page Numbers
<p>2.3 The student will identify the ordinal positions first through twentieth, using an ordered set of objects.</p>	<p>Students explore the concepts of order and sequence on the Hundred Number Wall Chart and on timelines.</p> <p>References: Putting Together and Taking Apart Investigation 2: Sessions 1-4 Investigation 5 Sessions 2-3 Session 6 Session 8 Timelines and Rhythm Patterns Investigation 1: Sessions 1-5</p>
<p>2.4 The student will identify the part of a set and/or region that represents fractions for one-half, one-third, one-fourth, one-eighth, and one-tenth and write the corresponding fraction.</p>	<p>References: Shapes, Halves, and Symmetry Investigation 3 Sessions 1-2 Sessions 3-5 Session 6 Sessions 6-8</p>

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Number and Number Sense, continued The student will	
<ul style="list-style-type: none"> a) count forward by twos, fives, and tens to 100, starting at various multiples of 2, 5, or 10, using mental mathematics, paper and pencil, hundred chart, calculators, and/or concrete objects, as appropriate; b) count backward by tens from 100; 	<p>References: Mathematical Thinking at Grade 2 Investigation 2: Session 6 Investigation 4: Sessions 1-4 Investigation 5: Sessions 4-5 Coins, Coupons, and Combinations Investigation 2: Sessions 1-10</p> <p>Students explore patterns of tens on the 100 chart, and they count backward as they subtract to solve separating and comparing problems.</p> <p>References: Mathematical Thinking at Grade 2 Investigation 5: Sessions 4-5: Activity, page 119 Coins, Coupons, and Combinations Investigation 2: Sessions 4-5, 10 Putting Together and Taking Apart Investigation 2: Sessions 1-4 Investigation 5 Session 1 Session 8</p>

Mathematics Standards	Correlation By Page Numbers
<p>c) group objects by threes and fours; and</p> <p>d) recognize even and odd numbers, using objects.</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Grade 2 students using <i>Investigations in Number, Data, and Space</i> practice skip counting by 2's, 5's, and 10's. They explore the relationship between skip counting and grouping and apply these concepts to problem situations.</p> <p>References: Mathematical Thinking at Grade 2 Investigation 4: Session 1: Teacher Note, page 82 Investigation 5: Sessions 4-5: Activity, page 119 Coins, Coupons, and Combinations Investigation 2: Sessions 1-10 Putting Together and Taking Apart Investigation 2: Sessions 1-2</p> <p>Students gain experience with even numbers as they count by twos.</p> <p>References: Mathematical Thinking at Grade 2 Investigation 4: Session 2: Teacher Note, page 91 Coins, Coupons, and Combinations Investigation 2: Sessions 1-5</p>

Mathematics Standards	Correlation By Page Numbers
<p>Computation and Estimation</p> <p>2.6 The student will recall basic addition facts — i.e., sums to 18 or less — and the corresponding subtraction facts.</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Mathematical Thinking at Grade 2 Investigation 1: Session 1 Investigation 2: Sessions 1-6, 8 Investigation 5: Sessions 1-3 Coins, Coupons, and Combinations Investigation 1: Sessions 1-11 Putting Together and Taking Apart Investigation 3: Session 1</p>
<p>2.7 The student, given two whole numbers whose sum is 99 or less, will</p> <p>a) estimate the sum; and</p>	<p>References: Coins, Coupons, and Combinations Investigation 1 Session 7 Sessions 8-9: Choice 1: Close to 20, p. 41 Investigation 3: Session 1: Activity, page 89</p>

Mathematics Standards	Correlation By Page Numbers
<p>b) find the sum, using various methods of calculation (mental computation, concrete materials, and paper and pencil).</p>	<p>References: Coins, Coupons, and Combinations Investigation 3: Sessions 1-2, 4-5 Putting Together and Taking Apart Investigation 1: Sessions 1, 3-4 Investigation 2: Session 1 Investigation 4: Sessions 1-4 Investigation 5: Sessions 4-5</p>
<p>2.8 The student, given two whole numbers, each of which is 99 or less, will a) estimate the difference; and</p>	<p>References: Coins, Coupons, and Combinations Investigation 1 Session 7 Sessions 8-9: Choice 1: Close to 20, p. 41 Investigation 3: Session 3: Activity, page 100</p>

Mathematics Standards	Correlation By Page Numbers
<p>b) find the difference, using various methods of calculation (mental computation, concrete materials, and paper and pencil).</p>	<p>References: Coins, Coupons, and Combinations Investigation 3: Sessions 3-5 Investigation 4: Sessions 2-4 Putting Together and Taking Apart Investigation 2: Sessions 3-4 Investigation 3: Session 2 Investigation 5: Session 7</p>
<p>2.9 The student will create and solve one-step addition and subtraction problems using data from simple tables, picture graphs, bar graphs, and practical situations.</p>	<p>References: Mathematical Thinking at Grade 2 Investigation 1: Session 1 Investigation 2: Sessions 1-3, 8 Investigation 4: Sessions 1-2 Coins, Coupons, and Combinations Investigation 1: Sessions 1-11 Investigation 4: Sessions 2-4</p>

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Computation and Estimation, continued 2.10 The student, given a simple addition or subtraction fact, will recognize and describe the related facts which represent and describe the inverse relationship between addition and subtraction (e.g., $3 + _ = 7$, $_ + 3 = 7$; $7 - 3 = _$, and $7 - _ = 3$).	References: Mathematical Thinking at Grade 2 Investigation 5: Session 3: Activity: Today's Number, page 115 Putting Together and Taking Apart Investigation 1: Session 1, pages 13-16, 18 Investigation 2: Sessions 3-4: Dialogue Box, page 65 Investigation 3: Sessions 1-5 Investigation 5: Sessions 7-8
Measurement 2.11 The student will a) count and compare a collection of pennies, nickels, dimes, and quarters whose total value is \$2.00 or less; and	References: Mathematical Thinking at Grade 2 Investigation 4: Session 2 Coins, Coupons, and Combinations Investigation 2: Sessions 6-9 Putting Together and Taking Apart Investigation 2: Sessions 5-6 Investigation 4: Sessions 3-4, pages 100-101

Mathematics Standards	Correlation By Page Numbers
<p>b) identify the correct usage of the cent symbol (ϕ), dollar symbol (\$), and decimal point (.).</p>	<p>References: Mathematical Thinking at Grade 2 Investigation 4: Session 2 Coins, Coupons, and Combinations Investigation 2: Session 6 Putting Together and Taking Apart Investigation 2: Sessions 5-6 Investigation 4: Sessions 3-4, pages 100-101 Investigation 5: Session 7: Activity, pages 128-129</p>
<p>2.12 The student will estimate and then use a ruler to make linear measurements to the nearest centimeter and inch, including measuring the distance around a polygon in order to determine perimeter.</p>	<p>Students explore linear measurement using direct and indirect comparison, nonstandard units, and <i>GeoLogo</i> software. They construct, compare, and measure simple paths in both on-computer and off-computer activities.</p> <p>References: How Long? How Far? Investigation 1: Sessions 1-8 Investigation 2: Sessions 4-8</p>

Mathematics Standards	Correlation By Page Numbers
2.13 The student, given grid paper, will estimate and then count the number of square units needed to cover a given surface in order to determine area.	<p>References: Shapes, Halves, and Symmetry Investigation 1 Sessions 2-3: Activities: Covering Pattern Blocks, Predict and Cover Sessions 4-5: Shape Puzzles Sessions 6-8: Activity: The Last Block Game Investigation 2: Sessions 3-6</p>
2.14 The student will estimate and then count the number of cubes in a rectangular box in order to determine volume.	<p>References: Shapes, Halves, and Symmetry Investigation 1 Sessions 2-3: Choice 2: Build the Geoblock, pages 19-21 Sessions 6-8: Building Buildings</p>

Mathematics Standards	Correlation By Page Numbers
<p>Measurement, continued</p> <p>2.15 The student will estimate and then determine weight/mass of familiar objects in pounds and/or kilograms, using a scale.</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Does It Walk, Crawl, or Swim? Investigation 2: Sessions 1-2: Teacher Note, page 47</p> <p>This objective is covered in <i>Investigations in Number, Data, and Space</i> at Grade 1 and Grade 3. 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.</p>
<p>2.16 The student will tell and write time to the quarter hour, using analog and digital clocks.</p>	<p>Time-related topics covered in the investigations in Grade 2 include sequencing events in time, comparing durations of time within a day, representing events in time, and interpreting traditional representations of time. <i>About Classroom Routines: Time and Time Again</i> describes time-related activities which students can do on a daily basis, including discussion of the daily schedule at school each day, identification of relevant clock times and durations, the setting of a timer to go off at specified intervals, the development of a schedule of important times at home, comparison of important times in different students' days, descriptions of types of clocks students have in their homes, and the creation of a timeline of a student's life, called a Life Line.</p>

Mathematics Standards	Correlation By Page Numbers
(continued)	<p>References: Timelines and Rhythm Patterns Investigation 1: Sessions 4-5 Investigation 2: Sessions 4-5 <i>All Units: About Classroom Routines: Time and Time Again</i></p>
<p>2.17 The student will use actual measuring devices to compare metric and U.S. Customary units (cups, pints, quarts, gallons, and liters) for measuring liquid volume, using the concepts of <i>more</i>, <i>less</i>, and <i>equivalent</i>.</p>	<p>Students assemble structures with Geoblocks, using multiple arrangements of three-dimensional shapes to make a three-dimensional whole. They explore spatial relationships and use logical reasoning as they use interlocking cubes to construct rectangular prisms with given dimensions.</p> <p>References: Shapes, Halves, and Symmetry Investigation 1 Sessions 2-3: Choice 2: Build the Geoblock, pages 19-21 Sessions 6-8: Building Buildings</p>

Mathematics Standards	Correlation By Page Numbers
2.18 The student will a) use calendar language appropriately (e.g., months, <i>today, yesterday, next week, last week</i>);	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Time-related topics covered in the investigations in Grade 2 include sequencing events in time, comparing durations of time within a day, representing events in time, and interpreting traditional representations of time. Students may use the number of days in school or the calendar date for the recurrent activity, Today's Number.</p> <p>References: Mathematical Thinking in Grade 2 Investigation 2: Session 1, page 22 Timelines and Rhythm Patterns Investigation 1: Sessions 1-6 Investigation 2: Sessions 4-5 <i>All Units: About Classroom Routines: Time and Time Again</i></p>
b) determine past and future days of the week; and	<p>References: Mathematical Thinking in Grade 2 Investigation 2: Session 1, page 22 Timelines and Rhythm Patterns Investigation 1: Sessions 1-6 Investigation 2: Sessions 4-5</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>c) identify specific dates on a given calendar.</p>	<p>References: Mathematical Thinking in Grade 2 Investigation 2: Session 1, page 22 Timelines and Rhythm Patterns Investigation 1: Sessions 1-6 Investigation 2: Sessions 4-5</p>
<p>2.19 The student will read the temperature on a Celsius and/or Fahrenheit thermometer to the nearest 10 degrees.</p>	<p>Students gain experience with number lines in the form of counting strips, line plots, and timelines as a precursor to the concept of temperature scales on a thermometer.</p> <p>References: Mathematical Thinking at Grade 2 Investigation 2: Session 1, pages 23-24 Investigation 4: Sessions 3-4, pages 92-95 How Many Pockets? How Many Teeth? Investigation 1: Session 1, pages 6, 8 Investigation 2: Session 3, page 43 Investigation 2: Sessions 4-5, pages 51-52 Timelines and Rhythm Patterns Investigation 1: Sessions 1-6</p>

Mathematics Standards	Correlation By Page Numbers
<p>Geometry</p> <p>2.20 The student will identify, describe, and sort three-dimensional (solid) concrete figures, including a cube, rectangular solid (prism), square pyramid, sphere, cylinder, and cone, according to the number and shape of the solid's faces, edges, and corners.</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Mathematical Thinking at Grade 2 Investigation 1: Sessions 1-4 Shapes, Halves, and Symmetry Investigation 1: Sessions 2-3: Activity: Build the Geoblock Sessions 6-8: Building Buildings Investigation 3: Sessions 1-2: Activity: Halves of Geoblocks Investigation 4: Sessions 1-2: Activity: Geoblock Buildings</p>
<p>2.21 The student will identify and create figures, symmetric along a line, using various concrete materials.</p>	<p>References: Shapes, Halves, and Symmetry Investigation 3: Sessions 3-5 Investigation 4: Sessions 1-7</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>2.22 The student will compare and contrast plane and solid geometric shapes (circle/sphere, square/cube, and rectangle/rectangular solid).</p>	<p>References: Mathematical Thinking at Grade 2 Investigation 3: Sessions 1-6 Shapes, Halves, and Symmetry Investigation 1: Sessions 1-8 Investigation 2: Sessions 1-6 Investigation 3: Sessions 1-8 Investigation 4: Sessions 1-7</p>
<p>Probability and Statistics</p> <p>2.23 The student will read, construct, and interpret a simple picture and bar graph.</p>	<p>References: Mathematical Thinking at Grade 2 Investigation 5: Sessions 1-2 Does It Walk, Crawl, or Swim? Investigation 1: Sessions 1-2 How Many Pockets? How Many Teeth? Investigation 1: Sessions 1-3 Investigation 2: Sessions 1-6 Investigation 3: Sessions 2-5</p>

Mathematics Standards	Correlation By Page Numbers
<p>2.24 The student will record data from experiments, using spinners and colored tiles/cubes, and use the data to predict which of two events is more likely to occur if the experiment is repeated.</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Students in Grade 2 may predict future events based on collected data. For example, they make a hypothesis based on sampling and the representation of a set of “mystery” data. They employ the scientific methods of research and experimentation as they sort objects that sink or float.</p> <p>References: Does It Walk, Crawl, or Swim? Investigation 2: Sessions 3-4 How Many Pockets? How Many Teeth? Investigation 2: Session 6</p>

Mathematics Standards	Correlation By Page Numbers
<p>Patterns, Functions, and Algebra</p> <p>2.25 The student will identify, create, and extend a wide variety of patterns, using numbers, concrete objects and pictures.</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Mathematical Thinking in Grade 2 Investigation 2: Session 6: Dialogue Box: Patterns in Addition, page 45 Coins, Coupons, and Combinations Investigation 2: Sessions 1-2, 4-5, 10 Investigation 4: Session 1 Putting Together and Taking Apart Investigation 2: Sessions 1-2 Timelines and Rhythm Patterns Investigation 2: Sessions 1-5</p>
<p>2.26 The student will solve problems by completing a numerical sentence involving the basic facts for addition and subtraction. Examples include: $3 + \underline{\quad} = 7$, or $9 - \underline{\quad} = 2$. Students will create story problems, using the numerical sentences.</p>	<p>References: Coins, Coupons, and Combinations Investigation 1: Session 6 Putting Together and Taking Apart Investigation 3: Sessions 1-5 Investigation 5: Sessions 6-7</p>

Other Criteria	Correlation By Page Numbers
<p>1. Materials emphasize the use of effective instructional practices and learning theory:</p> <ul style="list-style-type: none"> • Students are guided through problem-solving approaches. • Concepts are introduced through concrete experiences that use manipulatives and other technologies. • Multiple opportunities are provided for students to develop and apply concepts through the use of calculators, computers, and other technologies. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Grade 2 students using <i>Investigations in Number, Data, and Space</i> are guided through problem-solving approaches throughout the course as they carry out the investigations around which the curriculum is organized. For example, students explore strategies for creating and representing symmetrical figures.</p> <p>Grade 2 students using <i>Investigations in Number, Data, and Space</i> justify and explain the solutions to problems using physical materials throughout the course. Students use an extensive array of manipulative materials, including number cubes, dot cubes, square color tiles, hundred charts, balances, pattern blocks, buttons, coins, counters, attribute logic blocks, geoblocks, tetronimoes, and snap cubes.</p> <p>Ten of the 50 Curriculum Units (K-5) have software support with specific activities that use the software applications to develop and apply concepts. Calculators are used and should be available throughout Investigations activities to develop and apply concepts. Teacher Notes discussing this important mathematical tool are found in an early unit at each grade level.</p>

Other Criteria	Correlation By Page Numbers
<ul style="list-style-type: none"> • Students use the language of mathematics including specialized vocabulary and symbols. • Students use a variety of representations (graphical, numerical, symbolic, verbal, and physical) to connect mathematical concepts. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Grade 2 students using <i>Investigations in Number, Data, and Space</i> use mathematical language and notation throughout the course. For example, students use the equal sign and operational symbols for addition and subtraction to write number sentences, and they use symbols to represent rhythm patterns. The Dialogue Box is a feature that appears with many investigations and contains the text of discussions between teachers and students in which the teacher encourages students to use the language of mathematics to express mathematical ideas precisely.</p> <p>Grade 2 students using <i>Investigations in Number, Data, and Space</i> use a variety of representations to connect mathematical concepts throughout the course as they use physical materials, models, pictures, and writing to represent equivalent mathematical ideas. They create graphs, charts, drawings, and tables to represent and solve problems. They draw pictures and write number phrases and sentences to model the solution to a problem.</p>

Other Criteria	Correlation By Page Numbers
<p>2. Materials present content in an accurate, unbiased manner:</p> <ul style="list-style-type: none"> • Materials are relatively free of content and production errors (misspelled words, word omissions, incorrect answers). • Diverse groups (racial, ethnic, cultural, linguistic), males and females, people with disabilities, and people of all ages are represented appropriately. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p><i>Investigations in Number, Data, and Space</i> has copyrights and updates for 1998, and 2004. Misspelled words, word omissions, incorrect answers, etc. have been addressed and corrections made in these updates.</p> <p>The investigations are carefully designed to invite all students into mathematics – girls and boys, members of diverse cultural, ethnic, and language groups, and students with different strengths and interests. Problem contexts call on students to share experiences from their family, culture or community. The curriculum eliminates barriers that exclude some students from participating successfully in mathematics.</p>
<p>3. The mathematics content is significant and accurate:</p> <ul style="list-style-type: none"> • Materials are presented in an organized, logical manner which represents the current thinking on how students learn mathematics. 	<p>The TERC authors created this curriculum based on their own research of how children think about and best learn mathematics. The materials were field-tested 2-3 years to assure efficacy.</p>

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<ul style="list-style-type: none"> • Materials are organized appropriately within and among units of study. • Format design includes titles, subheadings, and appropriate cross-referencing for ease of use. • Writing style, length of sentences, vocabulary, graphics, and illustrations are appropriate. • Level of abstraction is appropriate, and real life examples, including careers, are provided. 	<p>Each Curriculum Unit has a content focus and is comprised of a set of Investigations. Each Investigation is comprised of a carefully sequenced set of activities to develop students’ mathematical thinking.</p> <p>The narrative lesson plan of each Investigation and each daily Class Session follow the same format K-5. What Happens and Mathematical Emphases, Activities, Class Discussions, Homework and Follow-Up are clearly labeled for ease of use.</p> <p>The text reading required by the student is minimized so as to focus attention on the mathematics. Any graphics and illustrations are provided to support the work of the student in the investigation.</p> <p>The Investigations curriculum moves students appropriately from the concrete to representational to symbolic notation throughout the work of an investigation. Many investigations begin with a question about a real-world situation to solve.</p>

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<ul style="list-style-type: none"> • Sufficient applications are provided to promote depth of application. 	Each Curriculum Unit has a content focus for instruction and learning. Students may spend 2-7 weeks of inquiry, learning, practice and application of skills and understandings of mathematical ideas in the unit.

Mathematics Standards	Correlation By Page Numbers
<p>Number and Number Sense</p> <p>3.1 The student will read and write six-digit numerals and identify the place value for each digit.</p>	<p>Grade 3 students using <i>Investigations in Number, Data, and Space</i> explore concepts of place value as they construct and investigate patterns on hundred and thousand charts. Counting by tens and hundreds supports students' familiarity with the base-ten system.</p> <p>References: Mathematical Thinking at Grade 3 Investigation 1: Sessions 1-3 Landmarks in the Hundreds Investigation 2: Sessions 1-3 Investigation 3: Session 1 Ten-Minute Math: Counting Around the Class Combining and Comparing Investigation 4: Sessions 3-4</p>
<p>3.2 The student will round a whole number, 9,999 or less, to the nearest ten, hundred, and thousand.</p>	<p>References: From Paces to Feet Ten-Minute Math: Estimation and Number Sense Up and Down the Number Line Ten-Minute Math: Estimation and Number Sense Combining and Comparing Investigation 3: Sessions 1-2 Ten-Minute Math: Estimation and Number Sense</p>

Mathematics Standards	Correlation By Page Numbers Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.
<p>3.3 The student will compare two whole numbers between 0 and 9,999, using symbols ($>$, $<$, or $=$) and words (<i>greater than, less than, or equal to</i>).</p>	<p>References: Mathematical Thinking at Grade 3 Investigation 3: Sessions 3-4 Flips, Turns, and Area Investigation 1: Session 4 Combining and Comparing Investigation 1: Sessions 1-3 Investigation 4: Sessions 1-2 Investigation 5: Sessions 1-3</p>
<p>3.4 The student will recognize and use the inverse relationships between addition/subtraction and multiplication/division to complete basic fact sentences. Students will use these relationships to solve problems such as $5 + 3 = 8$ and $8 - 3 = \underline{\quad}$.</p>	<p>References: Mathematical Thinking at Grade 3 Investigation 2: Sessions 3-4 Things That Come in Groups Investigation 1: Session 3: Dialogue Box, page 15 Investigation 4: Sessions 1-4 Up and Down the Number Line Investigation 1: Sessions 1-4 Combining and Comparing Investigation 4: Session 2: Teacher Note, page 52</p>

Mathematics Standards	Correlation By Page Numbers Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.
<p>3.5 The student will</p> <p>a) divide regions and sets to represent a fraction; and</p>	<p>References: Mathematical Thinking at Grade 3 Investigation 2: Sessions 3-4 Investigation 4: Session 2 Fair Shares Investigation 1: Sessions 1-4 Investigation 2: Sessions 1-7 Investigation 3: Sessions 1-3</p>
<p>b) name and write the fractions represented by a given model (area/region, length/measurement, and set). Fractions (including mixed numbers) will include halves, thirds, fourths, eighths, and tenths.</p>	<p>References: Mathematical Thinking at Grade 3 Investigation 2: Sessions 3-4 Flips, Turns, and Areas Investigation 2: Sessions 1-5 Turtle Paths Investigation 2: Sessions 1-2 Fair Shares Investigation 1: Sessions 1-4 Investigation 2: Sessions 1-7</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>Number and Number Sense, continued</p> <p>3.6 The student will compare the numerical value of two fractions having like and unlike denominators, using concrete or pictorial models involving areas/regions, lengths/measurements, and sets.</p>	<p>References:</p> <p>Fair Shares Investigation 1: Sessions 1-4 Investigation 2: Sessions 3-6</p>
<p>3.7 The student will read and write decimals expressed as tenths and hundredths, using concrete materials and models.</p>	<p>References:</p> <p>Mathematical Thinking at Grade 3 Investigation 4: Session 2 Landmarks in the Hundreds Investigation 2: Session 4 Up and Down the Number Line Investigation 3: Sessions 2-3, page 52 Combining and Comparing Investigation 3: Sessions 1-2 Fair Shares Investigation 3: Sessions 1-3</p>

Mathematics Standards	Correlation By Page Numbers Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.
Computation and Estimation 3.8 The student will solve problems involving the sum or difference of two whole numbers, each 9,999 or less, with or without regrouping, using various computational methods, including calculators, paper and pencil, mental computation, and estimation.	References: Mathematical Thinking at Grade 3 Investigation 4: Session 1 Up and Down the Number Line Investigation 1: Sessions 1-8 Combining and Comparing Investigation 1: Sessions 1-3 Investigation 4: Sessions 1-4 Investigation 5: Sessions 1-3
3.9 The student will recall the multiplication and division facts through the nines table.	References: Things That Come in Groups Investigation 3: Sessions 1-5 Investigation 4: Sessions 1-4 Investigation 5: Sessions 1-4 Landmarks in the Hundreds Investigation 1: Sessions 1-7 Investigation 2: Sessions 1-6

Mathematics Standards	Correlation By Page Numbers
<p>3.10 The student will represent multiplication and division, using area and set models, and create and solve problems that involve multiplication of two whole numbers, one factor 99 or less and the second factor 5 or less.</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Things That Come in Groups Investigation 1: Sessions 1-4 Investigation 3: Sessions 1-5 Investigation 5: Sessions 1-4 Landmarks in the Hundreds Investigation 1: Sessions 1-7 Investigation 2: Sessions 1-6</p>
<p>3.11 The student will add and subtract with proper fractions having like denominators of 10 or less, using concrete materials and pictorial models representing areas/regions, lengths/measurements, and sets.</p>	<p>References: Flips, Turns, and Areas Investigation 2: Sessions 1-5 Fair Shares Investigation 1: Sessions 1-4 Investigation 2: Sessions 1-7</p>
<p>3.12 The student will add and subtract with decimals expressed as tenths, using concrete materials, pictorial representations, and paper and pencil.</p>	<p>References: Combining and Comparing Investigation 3: Sessions 1-2</p>

Mathematics Standards	Correlation By Page Numbers
<p>Measurement</p> <p>3.13 The student will determine by counting the value of a collection of bills and coins whose total value is \$5.00 or less, compare the value of the coins or bills, and make change.</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Mathematical Thinking at Grade 3 Investigation 2: Sessions 5-7 Landmarks in the Hundreds Investigation 1: Sessions 6-7 Investigation 2: Session 4 Combining and Comparing Investigation 3: Sessions 1-2</p>
<p>3.14 The student will estimate and then use actual measuring devices with metric and U.S. Customary units to measure</p> <p>a) length — inches, feet, yards, centimeters, and meters;</p>	<p>References: 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 3: Sessions 1-2</p>

Mathematics Standards	Correlation By Page Numbers
<p>b) liquid volume — cups, pints, quarts, gallons, and liters; and</p> <p>c) weight/mass –ounces, pounds, grams, and kilograms.</p>	<p>Grade 3 students using <i>Investigations in Number, Data, and Space</i> find the volumes of rectangular prisms using models and cubes.</p> <p>References: Exploring Solids and Boxes Investigation 4: Sessions 1-3 Investigation 5: Sessions 1-4</p> <p>Grade 3 students using <i>Investigations in Number, Data, and Space</i> use nonstandard units with a pan balance to weigh and compare objects.</p> <p>References: Combining and Comparing Investigation 2: Sessions 1-2</p>
<p>3.15 The student will tell time to the nearest five-minute interval and to the nearest minute, using analog and digital clocks.</p>	<p>Grade 3 students using <i>Investigations in Number, Data, and Space</i> plan the activities for a party that will begin at 5:00 PM and end at 7:00 PM. Students give the starting time and duration for each activity.</p> <p>Reference: Combining and Comparing Investigation 3: Session 3</p>

Mathematics Standards	Correlation By Page Numbers
<p>3.16 The student will identify equivalent periods of time, including relationships among days, months, and years, as well as minutes and hours.</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Landmarks in the Hundreds Ten-Minute Math: Calendar Math Combining and Comparing Investigation 3: Session 3 Investigation 5: Sessions 1-3</p>
<p>3.17 The student will read temperature to the nearest degree from a Celsius thermometer and a Fahrenheit thermometer. Real thermometers and physical models of thermometers will be used.</p>	<p>Students learn about the climate and temperature in Siberia. Reference: Up and Down the Number Line Investigation 3: Session 1: Teacher Note, page 51</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>Geometry</p> <p>3.18 The student will analyze two-dimensional (plane) and three-dimensional (solid) geometric figures (circle, square, rectangle, triangle, cube, rectangular solid [prism], square pyramid, sphere, cone, and cylinder) and identify relevant properties, including the number of corners, square corners, edges, and the number and shape of faces, using concrete models.</p>	<p>References: Flips, Turns, and Area Investigation 1: Sessions 1-5 Exploring Solids and Boxes Investigation 1: Sessions 1-2 Investigation 2: Sessions 1-5 Investigation 3: Sessions 1-2 Investigation 4: Sessions 1-3</p>
<p>3.19 The student will identify and draw representations of line segments and angles, using a ruler or straightedge.</p>	<p>Students use <i>Geo-Logo</i> software to construct paths and turns and describe their properties. They turn and use intersecting paths to construct closed figures.</p> <p>References: Turtle Paths Investigation 1: Sessions 1-4 Investigation 2: Sessions 1-6 Investigation 3: Sessions 1-7</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>3.20 The student, given appropriate drawings or models, will identify and describe congruent and symmetrical, two-dimensional (plane) figures, using tracing procedures.</p>	<p>References: Mathematical Thinking at Grade 3 Investigation 2: Sessions 1, 3-4 Flips, Turns, and Area Investigation 1: Sessions 1-3, 5 Investigation 2: Sessions 2-3 Turtle Paths Investigation 2: Session 4: Teacher Note, pages 50-51 Investigation 3: Sessions 3-5</p>
<p>Probability and Statistics</p> <p>The student, given grid paper, will</p> <ul style="list-style-type: none"> a) collect and organize data on a given topic of his/her choice, using observations, measurements, surveys, or experiments; and 	<p>References: Mathematical Thinking at Grade 3 Investigation 3: Sessions 1-2 Things That Come in Groups Investigation 5: Sessions 2-3 From Paces to Feet Investigation 2: Sessions 2-7 Investigation 3: Sessions 1-3 Combining and Comparing Ten-Minute Math: Exploring Data</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>b) construct a line plot, a picture graph, or a bar graph to represent the results. Each graph will include an appropriate title and key.</p>	<p>References: Mathematical Thinking at Grade 3 Investigation 3: Sessions 1-4 Things that Come in Groups Investigation 5: Session 3 From Paces to Feet Investigation 1: Sessions 5-6: Dialogue Box, page 25 Investigation 2: Session 2 Combining and Comparing Investigation 4: Session 1</p>
<p>3.22 The student will read and interpret data represented in line plots, bar graphs, and picture graphs and write a sentence analyzing the data.</p>	<p>References: Mathematical Thinking at Grade 3 Investigation 3: Sessions 1-4 Things that Come in Groups Investigation 5: Session 3 From Paces to Feet Investigation 1: Sessions 5-6: Dialogue Box, page 25 Investigation 2: Session 2 Combining and Comparing Investigation 4: Session 1</p>

Mathematics Standards	Correlation By Page Numbers Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.
<p>3.23 The student will investigate and describe the concept of probability as chance and list possible results of a given situation.</p>	<p>References: Things That Come in Groups Ten-Minute Math: Likely or Unlikely? Exploring Solids and Boxes Ten-Minute Math: What Is Likely?</p>
<p>Patterns, Functions, and Algebra</p> <p>3.24 The student will recognize and describe a variety of patterns formed using concrete objects, numbers, tables, and pictures, and extend the pattern, using the same or different forms (concrete objects, numbers, tables, and pictures).</p>	<p>References: Mathematical Thinking at Grade 3 Investigation 1: Sessions 2-3 Things That Come in Groups Investigation 5: Session 1 Ten-Minute Math: Counting Around the Class Flips, Turns, and Area Investigation 1: Sessions 1-3 Fair Shares Investigation 2: Sessions 5-6</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>3.25 The student will</p> <ul style="list-style-type: none"> a) investigate and create patterns involving numbers, operations (addition and multiplication), and relations that model the identity and commutative properties for addition and multiplication; and b) demonstrate an understanding of equality by recognizing that the equal sign (=) links equivalent quantities, such as $4 \cdot 3 = 2 \cdot 6$. 	<p>References:</p> <p>Mathematical Thinking at Grade 3 Investigation 2: Sessions 5-7</p> <p>Things That Come in Groups Investigation 2: Sessions 1-6</p> <p>Landmarks in the Hundreds Investigation 1: Sessions 1-5</p> <p>Ten-Minute Math: Counting Around the Class</p> <p>Fair Shares Investigation 2: Sessions 5-6</p> <p>References:</p> <p>Things That Come in Groups Investigation 2: Sessions 3-4 Investigation 4: Sessions 1-4</p> <p>Landmarks in the Hundreds Investigation 1: Sessions 6-7</p> <p>Up and Down the Number Line Investigation 1: Sessions 6-7</p> <p>Combining and Comparing Investigation 1: Sessions 1-2</p>

Other Criteria	Correlation By Page Numbers
<p>1. Materials emphasize the use of effective instructional practices and learning theory:</p> <ul style="list-style-type: none"> • Students are guided through problem-solving approaches. • Concepts are introduced through concrete experiences that use manipulatives and other technologies. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Grade 3 students using <i>Investigations in Number, Data, and Space</i> are guided through problem-solving approaches throughout the course as they carry out the investigations around which the curriculum is organized. For example, students investigate why certain tetrominoes can cover given rectangles, while others cannot, and make generalizations based on their exploration.</p> <p>Grade 3 students using <i>Investigations in Number, Data, and Space</i> model problem situations with objects or drawings throughout the course. Students use a wide variety of manipulatives, including cubes, tiles, balances, pattern blocks, geoblocks, tetrominoes, and snap cubes to model mathematical and real-world problem situations. They use beans, cubes, and tiles to model strategies for counting, combining, and comparing quantities. They use square and triangle pieces to model different shapes with equal areas. They find factors by making equal groups of interlocking cubes, and then use drawings to record</p>

<p>Other Criteria</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>(continued)</p> <ul style="list-style-type: none"> • Multiple opportunities are provided for students to develop and apply concepts through the use of calculators, computers, and other technologies. • Students use the language of mathematics including specialized vocabulary and symbols. 	<p>their work. They prepare “Changes Cards” to model trips up and down in an elevator. They choose coupons that add up to a given amount of savings. They use paper rectangles to model brownies that must be cut into equal shares. They build polyhedra from descriptions.</p> <p>Ten of the 50 Curriculum Units (K-5) have software support with specific activities that use the software applications to develop and apply concepts. Calculators are used and should be available throughout Investigations activities to develop and apply concepts. Teacher Notes discussing this important mathematical tool are found in an early unit at each grade level.</p> <p>Students in Grades 3 using <i>Investigations in Number, Data, and Space</i> use mathematical language and symbols throughout the course. The Dialogue Box is a feature that appears with many investigations and contains the text of discussions between teachers and students in which the teacher encourages students to use the language of mathematics to express mathematical ideas precisely. Students use mathematical notation in a variety of situations. For example, students depict multiplication situations symbolically as mathematical expressions using multiplication and repeated addition.</p>

Other Criteria	Correlation By Page Numbers
<ul style="list-style-type: none"> Students use a variety of representations (graphical, numerical, symbolic, verbal, and physical) to connect mathematical concepts. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Grade 3 students using <i>Investigations in Number, Data, and Space</i> analyze mathematical models and representations to determine equivalence in familiar situations throughout the course as they use physical materials, models, pictures, and writing to represent equivalent mathematical ideas. Students use a wide variety of manipulatives, including cubes, tiles, balances, pattern blocks, geoblocks, tetronimoes, and snap cubes to model numbers, operations, patterns, and problem situations. They create graphs, charts, drawings, and tables to organize, record, and communicate mathematical ideas. They write story problems, riddles, descriptions, and problem solutions.</p>

<p>Other Criteria</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>2. Materials present content in an accurate, unbiased manner:</p> <ul style="list-style-type: none"> • Materials are relatively free of content and production errors (misspelled words, word omissions, incorrect answers). • Diverse groups (racial, ethnic, cultural, linguistic), males and females, people with disabilities, and people of all ages are represented appropriately. 	<p><i>Investigations in Number, Data, and Space</i> has copyrights and updates for 1998, and 2004. Misspelled words, word omissions, incorrect answers, etc. have been addressed and corrections made in these updates.</p> <p>The investigations are carefully designed to invite all students into mathematics – girls and boys, members of diverse cultural, ethnic, and language groups, and students with different strengths and interests. Problem contexts call on students to share experiences from their family, culture or community. The curriculum eliminates barriers that exclude some students from participating successfully in mathematics.</p>
<p>3. The mathematics content is significant and accurate:</p> <ul style="list-style-type: none"> • Materials are presented in an organized, logical manner which represents the current thinking on how students learn mathematics. 	<p>The TERC authors created this curriculum based on their own research of how children think about and best learn mathematics. The materials were field-tested 2-3 years to assure efficacy.</p>

<p>Other Criteria</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<ul style="list-style-type: none"> • Materials are organized appropriately within and among units of study. • Format design includes titles, subheadings, and appropriate cross-referencing for ease of use. • Writing style, length of sentences, vocabulary, graphics, and illustrations are appropriate. • Level of abstraction is appropriate, and real life examples, including careers, are provided. • Sufficient applications are provided to promote depth of application. 	<p>Each Curriculum Unit has a content focus and is comprised of a set of Investigations. Each Investigation is comprised of a carefully sequenced set of activities to develop students’ mathematical thinking.</p> <p>The narrative lesson plan of each Investigation and each daily Class Session follow the same format K-5. What Happens and Mathematical Emphases, Activities, Class Discussions, Homework and Follow-Up are clearly labeled for ease of use.</p> <p>The text reading required by the student is minimized so as to focus attention on the mathematics. Any graphics and illustrations are provided to support the work of the student in the investigation.</p> <p>The Investigations curriculum moves students appropriately from the concrete to representational to symbolic notation throughout the work of an investigation. Many investigations begin with a question about a real-world situation to solve.</p> <p>Each Curriculum Unit has a content focus for instruction and learning. Students may spend 2-7 weeks of inquiry, learning, practice and application of skills and understandings of mathematical ideas in the unit.</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>Number and Number Sense</p> <p>4.1 The student will</p> <p>a) identify (orally and in writing) the place value for each digit in a whole number expressed through millions;</p> <p>b) compare two whole numbers expressed through millions, using symbols ($>$, $<$, or $=$); and</p>	<p>References:</p> <p>Landmarks in the Thousands Investigation 1: Sessions 1-3 Investigation 2: Sessions 1-5 Investigation 3: Sessions 1-5 Investigation 4: Sessions 1-3</p> <p>Money, Miles, and Large Numbers Investigation 3: Sessions 1-4</p> <p>References:</p> <p>Mathematical Thinking at Grade 4 Investigation 1: Session 4</p> <p>Money, Miles, and Large Numbers Investigation 1: Sessions 1-2</p> <p>Packages and Groups Investigation 2: Sessions 2-3</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>c) round whole numbers expressed through millions to the nearest thousand, ten thousand, and hundred thousand.</p>	<p>References: Mathematical Thinking at Grade 4 Investigation 1: Sessions 2-4 Ten-Minute Math: Estimation and Number Sense Landmarks in the Thousands Investigation 3: Sessions 3-5 The Shape of the Data Ten-Minute Math: Estimation and Number Sense Money, Miles, and Large Numbers Investigation 3: Session 1</p>
<p>4.2 The student will a) identify, model, and compare rational numbers (fractions and mixed numbers), using concrete objects and pictures;</p>	<p>References: 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 1-3 Three out of Four Like Spaghetti Investigation 1: Sessions 1-4</p>

Mathematics Standards	Correlation By Page Numbers
<p>b) represent equivalent fractions; and</p> <p>c) relate fractions to decimals, using concrete objects.</p>	<p>References: Different Shapes, Equal Pieces Investigation 1: Session 5 Investigation 2: Session 3 Investigation 3: Sessions 1-2</p> <p>References: Money, Miles, and Large Numbers Investigation 1: Sessions 1-2 Investigation 2: Sessions 1-2</p>
<p>4.3 The student will compare the numerical value of fractions (with like and unlike denominators) having denominators of 12 or less, using concrete materials.</p>	<p>References: Different Shapes, Equal Pieces Investigation 1: Session 5 Investigation 2: Sessions 1-4 Investigation 3: Sessions 3-5 Three Out of Four Like Spaghetti Investigation 1: Sessions 2-3</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>4.4 The student will</p> <p>a) read, write, represent, and identify decimals expressed through thousandths;</p> <p>b) round to the nearest whole number, tenth, and hundredth; and</p>	<p>References: Money, Miles, and Large Numbers Investigation 1 Sessions 1-2 Sessions 4-8 Investigation 2 Sessions 1-2 Session 4</p> <p>References: Mathematical Thinking at Grade 4 Investigation 1: Sessions 2-4 Landmarks in the Thousands Investigation 3: Sessions 3-5 Money, Miles, and Large Numbers Investigation 1: Sessions 1-2, 7-8 Investigation 2: Sessions 1-2 Investigation 3: Session 1</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>c) compare the value of two decimals, using symbols (<, >, or =), concrete materials, drawings, and calculators.</p>	<p>References: Money, Miles, and Large Numbers Investigation 1: Sessions 1-2 Investigation 2: Sessions 1-2</p>
<p>Computation and Estimation</p> <p>4.5 The student will estimate whole-number sums and differences and describe the method of estimation. Students will refine estimates, using terms such as <i>closer to, between, and a little more than.</i></p>	<p>References: Mathematical Thinking at Grade 4 Investigation 1: Sessions 2-4 Investigation 2: Sessions 3-4: Choice 2, page 42 Landmarks in the Thousands Investigation 3: Sessions 3-5 The Shape of the Data Ten-Minute Math: Estimation and Number Sense Packages and Groups Investigation 2: Sessions 2-3</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>4.6 The student will add and subtract whole numbers written in vertical and horizontal form, choosing appropriately between paper and pencil methods and calculators.</p>	<p>References: Mathematical Thinking at Grade 4 Investigation 1: Sessions 2-4 Investigation 2: Sessions 1-2 Investigation 3: Sessions 3-5 Landmarks in the Thousands Investigation 2: Sessions 2-4 Money, Miles, and Large Numbers Investigation 3: Sessions 1-4</p>
<p>4.7 The student will find the product of two whole numbers when one factor has two digits or fewer and the other factor has three digits or fewer, using estimation and paper and pencil. For larger products (a two-digit numeral times a three-digit numeral), estimation and calculators will be used.</p>	<p>References: Arrays and Shares Investigation 1: Sessions 1-3 Investigation 3: Sessions 1-5 Packages and Groups Investigation 1: Sessions 1-3 Investigation 2: Sessions 1-3 Investigation 3: Sessions 1-10</p>

Mathematics Standards	Correlation By Page Numbers
4.8 The student will estimate and find the quotient of two whole numbers, given a one-digit divisor.	<p>References: Mathematical Thinking at Grade 4 Investigation 1: Sessions 2-3 Arrays and Shares Investigation 2: Sessions 7-8 Investigation 3: Sessions 2-4 Landmarks in the Thousands Investigation 2: Session 1 Packages and Groups Investigation 3: Sessions 1-10</p>
<p>Computation and Estimation, continued</p> 4.9 The student will <ul style="list-style-type: none"> a) add and subtract with fractions having like and unlike denominators of 12 or less, using concrete materials, pictorial representations, and paper and pencil; b) add and subtract with decimals through thousandths, using concrete materials, pictorial representations, and paper and pencil; and 	<p>References: Different Shares, Equal Pieces Investigation 1: Session 5 Investigation 2: Session 3</p> <p>References: Money, Miles, and Large Numbers Investigation 1: Sessions 1-2, 4-8 Investigation 2: Sessions 1-2, 4</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>c) solve problems involving addition and subtraction with fractions having like and unlike denominators of 12 or less and with decimals expressed through thousandths, using various computational methods, including calculators, paper and pencil, mental computation, and estimation.</p>	<p>References: Different Shares, Equal Pieces Investigation 1: Session 5 Investigation 2: Session 3 Money, Miles, and Large Numbers Investigation 1: Sessions 1-2, 4-8 Investigation 2: Sessions 1-2, 4</p>
<p>Measurement</p> <p>4.10 The student will</p> <p>a) estimate and measure weight/mass, using actual measuring devices, and describe the results in U.S. Customary/metric units as appropriate, including ounces, pounds, grams, and kilograms;</p> <p>b) identify equivalent measurements between units within the U.S. Customary system (ounces and pounds) and between units within the metric system (grams and kilograms); and</p>	<p>Grade 3 students using <i>Investigations in Number, Data, and Space</i> use nonstandard units with a pan balance to weigh and compare objects. In Grade 5, students order items by weight, and measure and compare the weights of objects using a balance scale and metric and customary weight units.</p> <p>Grade 3 students using <i>Investigations in Number, Data, and Space</i> use nonstandard units with a pan balance to weigh and compare objects. In Grade 5, students order items by weight, and measure and compare the weights of objects using a balance scale and metric and customary weight units.</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>c) estimate the conversion of ounces and grams and pounds and kilograms, using approximate comparisons (1 ounce is about 28 grams, or 1 gram is about the weight of a paper clip; 1 kilogram is a little more than 2 pounds).*</p> <p><i>*The intent of this standard is for students to make ballpark comparisons and not to memorize conversion factors between U. S. Customary and metric units.</i></p>	<p>Grade 3 students using <i>Investigations in Number, Data, and Space</i> use nonstandard units with a pan balance to weigh and compare objects. In Grade 5, students order items by weight, and measure and compare the weights of objects using a balance scale and metric and customary weight units.</p>
<p>4.11 The student will</p> <p>a) estimate and measure length, using actual measuring devices, and describe the results in both metric and U.S. Customary units, including part of an inch ($\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$), inches, feet, yards, millimeters, centimeters, and meters;</p>	<p>References:</p> <p>The Shape of the Data Investigation 2: Sessions 1-4</p> <p>Money, Miles, and Large Numbers Investigation 2: Sessions 1-4 Investigation 3: Sessions 2-4</p> <p>Changes Over Time Unit Preparation: Session 3</p> <p>Sunken Ships and Grid Patterns Investigation 1: Sessions 1-6</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>b) identify equivalent measurements between units within the U.S. Customary system (inches and feet; feet and yards; inches and yards) and between units within the metric system (millimeters and centimeters; centimeters and meters; and millimeters and meters); and</p>	<p>References: The Shape of the Data Investigation 2: Session 4 Money, Miles, and Large Numbers Investigation 2: Sessions 3-4 Investigation 3: Sessions 2-4 Sunken Ships and Grid Patterns Investigation 1: Session 1</p>
<p>Measurement, continued</p> <p>d) estimate the conversion of inches and centimeters, yards and meters, and miles and kilometers, using approximate comparisons (1 inch is about 2.5 centimeters, 1 meter is a little longer than 1 yard, 1 mile is slightly farther than 1.5 kilometers, or 1 kilometer is slightly farther than half a mile). *</p> <p><i>*The intent of this standard is for students to make ballpark comparisons and not to memorize conversion factors between U. S. Customary and metric units.</i></p>	<p>References: The Shape of the Data Investigation 2: Session 1, page 24 Changes Over Time Unit Preparation: Session 3</p>

Mathematics Standards	Correlation By Page Numbers
<p>4.12 The student will</p> <ul style="list-style-type: none"> a) estimate and measure liquid volume, using actual measuring devices and using metric and U.S. Customary units, including cups, pints, quarts, gallons, milliliters, and liters; b) identify equivalent measurements between units within the U.S. Customary system (cups, pints, quarts, and gallons) and between units within the metric system (milliliters and liters); and 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Grade 4 students using <i>Investigations in Number, Data, and Space</i> estimate and measure the volumes of rectangular prisms with interlocking cubes. They also estimate and measure large quantities of objects (beans) in several containers, using measuring tools such as small cups, spoons, or a balance.</p> <p>References: Seeing Solids and Silhouettes Investigation 1: Sessions 1-2 Landmarks in the Thousands Investigation 1: Session 2 Investigation 3: Sessions 3-5: Choice 1: How Many in the Jar?</p> <p>Grade 4 students using <i>Investigations in Number, Data, and Space</i> estimate and measure the volumes of rectangular prisms with interlocking cubes. They also estimate and measure large quantities of objects (beans) in several containers, using measuring tools such as small cups, spoons, or a balance.</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>Measurement, continued</p> <p>c) estimate the conversion of quarts and liters, using approximate comparisons (1 quart is a little less than 1 liter, 1 liter is a little more than 1 quart).*</p> <p><i>*The intent of this standard is for students to make ballpark comparisons and not to memorize conversion factors between U. S. Customary and metric units.</i></p>	<p>Grade 4 students using <i>Investigations in Number, Data, and Space</i> estimate and measure the volumes of rectangular prisms with interlocking cubes. They also estimate and measure large quantities of objects (beans) in several containers, using measuring tools such as small cups, spoons, or a balance.</p>
<p>4.13 The student will</p> <p>a) identify and describe situations representing the use of perimeter and area; and</p>	<p>References:</p> <p>Arrays and Shares Investigation 2: Sessions 1-6</p> <p>Landmarks in the Thousands Investigation 1: Session 2</p> <p>Different Shapes, Equal Pieces Investigation 1: Sessions 1-5 Investigation 2: Sessions 1-4</p> <p>Sunken Ships and Grid Patterns Ten-Minute Math: Lengths and Perimeters</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>b) use measuring devices to find perimeter in both standard and nonstandard units of measure.</p>	<p>References: Sunken Ships and Grid Patterns Ten-Minute Math: Lengths and Perimeters</p>
<p>Geometry</p> <p>4.14 The student will investigate and describe the relationships between and among points, lines, line segments, and rays.</p>	<p>References: Seeing Solids and Silhouettes Ten-Minute Math: Quick Images Changes Over Time Ten-Minute Math: Quick Images Sunken Ships and Grid Patterns Investigation 1: Sessions 1-6 Investigation 2: Sessions 1-9 Ten-Minute Math: Lengths and Perimeters</p>

Mathematics Standards	Correlation By Page Numbers
<p>4.15 The student will</p> <ul style="list-style-type: none"> a) identify and draw representations of points, lines, line segments, rays, and angles, using a straightedge or ruler; and b) describe the path of shortest distance between two points on a flat surface. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Seeing Solids and Silhouettes Ten-Minute Math: Quick Images Changes Over Time Ten-Minute Math: Quick Images Sunken Ships and Grid Patterns Investigation 1: Sessions 1-6 Investigation 2: Sessions 1-9 Ten-Minute Math: Lengths and Perimeters</p> <p>References: Sunken Ships and Grid Patterns Investigation 1 Session 1 Sessions 3-4 Sessions 5-6 <i>Geo-Logo</i> Teacher Tutorial</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>4.16 The student will identify and draw representations of lines that illustrate intersection, parallelism, and perpendicularity.</p>	<p>Grade 4 students using the <i>Investigations in Number, Data, and Space</i> series gain experience with parallel lines and perpendicular lines as they use the computer to construct and manipulate points, segments, and rectangles on coordinate grids.</p> <p>References: Sunken Ships and Grid Patterns Investigation 1: Sessions 1-6 Investigation 2: Sessions 1-9 Ten-Minute Math: Lengths and Perimeters Geo-Logo Teacher Tutorial</p>
<p>4.17 The student will</p> <p>a) analyze and compare the properties of two-dimensional (plane) geometric figures (circle, square, rectangle, triangle, parallelogram, and rhombus) and three-dimensional (solid) geometric figures (sphere, cube, and rectangular solid [prism]);</p>	<p>References: Seeing Solids and Silhouettes Investigation 1: Sessions 1-2 Investigation 2: Sessions 1-5 Investigation 3: Sessions 1-3 Different Shapes, Equal Pieces Investigation 2: Sessions 1-4 Sunken Ships and Grid Patterns Investigation 2: Sessions 1-9</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>b) identify congruent and noncongruent shapes; and</p> <p>c) investigate congruence of plane figures after geometric transformations such as reflection (flip), translation (slide) and rotation (turn), using mirrors, paper folding, and tracing.</p>	<p>References: Mathematical Thinking at Grade 4 Investigation 4: Sessions 5-6 Different Shapes, Equal Pieces Investigation 1: Session 1 Sunken Ships and Grid Patterns Investigation 2: Sessions 1-9</p> <p>References: Mathematical Thinking at Grade 4 Investigation 4: Sessions 1-6 Different Shapes, Equal Pieces Investigation 1: Session 1 Sunken Ships and Grid Patterns Investigation 2: Sessions 1-9</p>
<p>4.18 The student will identify the ordered pair for a point and locate the point for an ordered pair in the first quadrant of a coordinate plane.</p>	<p>References: Sunken Ships and Grid Patterns Investigation 1: Sessions 1-6 Investigation 2: Sessions 1-9 Ten-Minute Math: Lengths and Perimeters</p>

Mathematics Standards	Correlation By Page Numbers
<p>Probability and Statistics</p> <p>4.19 The student will</p> <ul style="list-style-type: none"> a) predict the likelihood of outcomes of a simple event, using the terms <i>certain, likely, unlikely, impossible</i>; and b) determine the probability of a given simple event, using concrete materials. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: 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?</p> <p>References: 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?</p>

Mathematics Standards	Correlation By Page Numbers
<p>4.20 The student will collect, organize, and display data in line and bar graphs with scale increments of one or greater than one and use the display to interpret the results, draw conclusions, and make predictions.</p>	<p>References: The Shape of the Data Investigation 1: Sessions 1-3 Investigation 2: Sessions 1-7 Investigation 3: Sessions 1-5 Changes Over Time Investigation 3: Sessions 1-8 Three out of Four Like Spaghetti Investigation 2: Sessions 1-7</p>
<p>Patterns, Functions, and Algebra</p> <p>4.21 The student will recognize, create, and extend numerical and geometric patterns, using concrete materials, number lines, symbols, tables, and words.</p>	<p>References: Mathematical Thinking at Grade 4 Investigation 3: Sessions 1-5 Investigation 4: Sessions 1-6 Arrays and Shares Investigation 1: Sessions 1-3 Landmarks in the Thousands Investigation 4: Sessions 1-3 Packages and Groups Investigation 1: Sessions 1-3</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>4.22 The student will recognize and demonstrate the meaning of equality, using symbols representing numbers, operations, and relations [e.g., $3 + 5 = 5 + 3$ and $15 + (35 + 16) = (15 + 35) + 16$].</p>	<p>References:</p> <ul style="list-style-type: none"> Arrays and Shares <ul style="list-style-type: none"> Investigation 2: Sessions 2-3: Teacher Note, page 23 Investigation 3: Session 1 Landmarks in the Thousands <ul style="list-style-type: none"> Investigation 2: Sessions 2-4 Changes Over Time <ul style="list-style-type: none"> Investigation 1: Sessions 5-6 Packages and Groups <ul style="list-style-type: none"> Investigation 3: Sessions 1-2

<p>Other Criteria</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>1. Materials emphasize the use of effective instructional practices and learning theory:</p> <ul style="list-style-type: none"> • Students are guided through problem-solving approaches. • Concepts are introduced through concrete experiences that use manipulatives and other technologies. 	<p>Grade 4 students using <i>Investigations in Number, Data, and Space</i> are guided to select, modify, develop, and apply strategies to solve a variety of mathematical and practical problems and to investigate and understand mathematical concepts throughout the course. For example, through exploration and investigation, students learn to visualize what objects look like from different perspectives.</p> <p>Grade 4 students using <i>Investigations in Number, Data, and Space</i> justify and explain the solutions to problems using physical materials throughout the course. Students use an extensive array of manipulative materials, including number cubes, dot cubes, square color tiles, hundred charts, balances, pattern blocks, buttons, coins, counters, attribute logic blocks, geoblocks, tetronimoes, and snap cubes. For example, students use interlocking cubes to model rectangular arrays.</p>

<p>Other Criteria</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<ul style="list-style-type: none"> • Multiple opportunities are provided for students to develop and apply concepts through the use of calculators, computers, and other technologies. • Students use the language of mathematics including specialized vocabulary and symbols. 	<p>Ten of the 50 Curriculum Units (K-5) have software support with specific activities that use the software applications to develop and apply concepts. Calculators are used and should be available throughout Investigations activities to develop and apply concepts. Teacher Notes discussing this important mathematical tool are found in an early unit at each grade level.</p> <p>Students in Grades 4 using <i>Investigations in Number, Data, and Space</i> use mathematical language to express mathematical ideas throughout the course. The Dialogue Box is a feature that appears with many investigations and contains the text of discussions between teachers and students in which the teacher encourages students to use the language of mathematics to present mathematical ideas. Students use mathematical notation to communicate and explain mathematical situations throughout the course. For example, students use numbers and operational and relational symbols in expressions and number sentences to represent problem situations.</p>

Other Criteria	Correlation By Page Numbers Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.
<ul style="list-style-type: none"> • Students use a variety of representations (graphical, numerical, symbolic, verbal, and physical) to connect mathematical concepts. 	Grade 4 students using <i>Investigations in Number, Data, and Space</i> use a variety of representations, including physical materials and models, tables and charts, graphs and diagrams, and symbols and words, to represent equivalent mathematical ideas and connect mathematical concepts. They model fractions with paper "cakes" and geoboards. They construct multiple plaids to demonstrate visual and numerical patterns in a multiplication table. They name and locate points and calculate distances on a coordinate plane, using a grid as a map to connect visual and numerical descriptions of locations and distances. They collect, record, organize, represent, and describe categorical data using line plots, bar graphs, and fractions.

<p>Other Criteria</p>	<p>Correlation By Page Numbers Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>2. Materials present content in an accurate, unbiased manner:</p> <ul style="list-style-type: none"> • Materials are relatively free of content and production errors (misspelled words, word omissions, incorrect answers). • Diverse groups (racial, ethnic, cultural, linguistic), males and females, people with disabilities, and people of all ages are represented appropriately. 	<p><i>Investigations in Number, Data, and Space</i> has copyrights and updates for 1998, and 2004. Misspelled words, word omissions, incorrect answers, etc. have been addressed and corrections made in these updates.</p> <p>The investigations are carefully designed to invite all students into mathematics – girls and boys, members of diverse cultural, ethnic, and language groups, and students with different strengths and interests. Problem contexts call on students to share experiences from their family, culture or community. The curriculum eliminates barriers that exclude some students from participating successfully in mathematics.</p>

<p>Other Criteria</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>3. The mathematics content is significant and accurate:</p> <ul style="list-style-type: none"> • Materials are presented in an organized, logical manner which represents the current thinking on how students learn mathematics. • Materials are organized appropriately within and among units of study. • Format design includes titles, subheadings, and appropriate cross-referencing for ease of use. 	<p>The TERC authors created this curriculum based on their own research of how children think about and best learn mathematics. The materials were field-tested 2-3 years to assure efficacy.</p> <p>Each Curriculum Unit has a content focus and is comprised of a set of Investigations. Each Investigation is comprised of a carefully sequenced set of activities to develop students' mathematical thinking.</p> <p>The narrative lesson plan of each Investigation and each daily Class Session follow the same format K-5. What Happens and Mathematical Emphases, Activities, Class Discussions, Homework and Follow-Up are clearly labeled for ease of use.</p>

<p>Other Criteria</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<ul style="list-style-type: none"> • Writing style, length of sentences, vocabulary, graphics, and illustrations are appropriate. • Level of abstraction is appropriate, and real life examples, including careers, are provided. • Sufficient applications are provided to promote depth of application. 	<p>The text reading required by the student is minimized so as to focus attention on the mathematics. Any graphics and illustrations are provided to support the work of the student in the investigation.</p> <p>The Investigations curriculum moves students appropriately from the concrete to representational to symbolic notation throughout the work of an investigation. Many investigations begin with a question about a real-world situation to solve.</p> <p>Each Curriculum Unit has a content focus for instruction and learning. Students may spend 2-7 weeks of inquiry, learning, practice and application of skills and understandings of mathematical ideas in the unit.</p>

Mathematics Standards	Correlation By Page Numbers
<p>Number and Number Sense</p> <p>5.1 The student will</p> <p>a) read, write, and identify the place values of decimals through thousandths;</p> <p>b) round decimal numbers to the nearest tenth or hundredth; and</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Name That Portion Investigation 3: Sessions 1-8 Between Never and Always Investigation 1: Sessions 1-2 Building on Numbers You Know Investigation 2: Session 3: Teacher Note, page 54 Containers and Cubes Ten-Minute Math: Counting Around the Class: Fractions and Decimals Data: Kids, Cats, and Ads Investigation 3: Session 1, page 50</p> <p>References: Between Never and Always Ten-Minute Math: Nearest Answer Measurement Benchmarks Ten-Minute Math: Estimation and Number Sense Data, Kids, Cats, and Ads Investigation 3: Sessions 1, page 50</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>c) compare the values of two decimals through thousandths, using the symbols $>$, $<$, or $=$.</p>	<p>References: Name That Portion Investigation 3: Sessions 2-6</p>
<p>5.2 The student will</p> <p>a) recognize and name commonly used fractions (halves, fourths, fifths, eighths, and tenths) in their equivalent decimal form and vice versa; and</p> <p>b) order a given set of fractions and decimals from least to greatest. Fractions will include like and unlike denominators limited to 12 or less, and mixed numbers.</p>	<p>References: Name That Portion Investigation 1: Sessions 1-7 Investigation 3: Sessions 1-8 Between Never and Always Investigation 1: Sessions 1-2 Building on Numbers You Know Investigation 2: Session 3: Teacher Note, page 54 Data, Kids, Cats, and Ads Investigation 3: Session 1-4</p> <p>References: Name That Portion Investigation 1: Sessions 5-7 Investigation 2: Sessions 4-8 Investigation 3: Sessions 2-6</p>

Mathematics Standards	Correlation By Page Numbers
<p>Computation and Estimation</p> <p>5.3 The student will create and solve problems involving addition, subtraction, multiplication, and division of whole numbers, using paper and pencil, estimation, mental computation, and calculators.</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Mathematical Thinking at Grade 5 Investigation 2: Sessions 1-5 Investigation 3: Sessions 1-5 Building on Numbers You Know Investigation 1: Sessions 1, 3-5, 8 Investigation 2: Sessions 1-7 Investigation 3: Sessions 1-10</p>
<p>5.4 The student will find the sum, difference, and product of two numbers expressed as decimals through thousandths, using an appropriate method of calculation, including paper and pencil, estimation, mental computation, and calculators.</p>	<p>References: Name That Portion Investigation 3: Sessions 2-4, 7 Measurement Benchmarks Ten-Minute Math: Estimation and Number Sense</p>
<p>5.5 The student, given a dividend of four digits or fewer and a divisor of two digits or fewer, will find the quotient and remainder.</p>	<p>References: Mathematical Thinking at Grade 5 Investigation 3: Sessions 2-4 Building on Numbers You Know Investigation 2: Sessions 1-7 Investigation 3: Sessions 4-10 Investigation 5: Sessions 1-7</p>

Mathematics Standards	Correlation By Page Numbers Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.
5.6 The student, given a dividend expressed as a decimal through thousandths and a single-digit divisor, will find the quotient.	References: Measurement Benchmarks Ten-Minute Math: Estimation and Number Sense
5.7 The student will add and subtract with fractions and mixed numbers, with and without regrouping, and express answers in simplest form. Problems will include like and unlike denominators limited to 12 or less.	References: Name That Portion Investigation 2 Sessions 1-3 Sessions 6-9 Data: Kids, Cats, and Ads Investigation 4: Session 3
Measurement 5.8 The student will describe and determine the perimeter of a polygon and the area of a square, rectangle, and right triangle, given the appropriate measures.	References: Mathematical Thinking at Grade 5 Investigation 1: Sessions 1-3 Picturing Polygons Investigation 3: Sessions 4-6 Measurement Benchmarks Investigation 1: Sessions 5-6 Name That Portion Investigation 1: Sessions 2-4 Investigation 3: Sessions 2, 8

Mathematics Standards	Correlation By Page Numbers
5.9 The student will identify and describe the diameter, radius, chord, and circumference of a circle.	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Grade 5 students using <i>Investigations in Number, Data, and Space</i> investigate properties and relationships of circles as they explore fractional areas of a clock face and as they construct circle graphs.</p> <p>References: Name That Portion Investigation 1: Session 7, page 31 Investigation 2: Sessions 1-2 Investigation 3: Session 8 Investigation 4: Sessions 2-7</p>
5.10 The student will differentiate between perimeter, area, and volume and identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation.	<p>References: Mathematical Thinking at Grade 5 Investigation 1: Sessions 1-3 Measurement Benchmarks Investigation 2: Session 4 Picturing Polygons Investigation 3: Sessions 4-6 Containers and Cubes Investigation 4: Sessions 1-5 Data: Kids, Cats, and Ads Ten-Minute Math: Volume and Surface Area</p>

Mathematics Standards	Correlation By Page Numbers
<p>5.11 The student will choose an appropriate measuring device and unit of measure to solve problems involving measurement of</p> <ul style="list-style-type: none"> a) length — part of an inch ($\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$), inches, feet, yards, miles, millimeters, centimeters, meters, and kilometers; b) weight/mass — ounces, pounds, tons, grams, and kilograms; c) liquid volume — cups, pints, quarts, gallons, milliliters, and liters; 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Measurement Benchmarks Investigation 1: Sessions 1-8 Containers and Cubes Investigation 3: Sessions 1-3 Investigation 4: Session 6</p> <p>References: Measurement Benchmarks Investigation 2 Sessions 1-3 Sessions 5-8</p> <p>References: Measurement Benchmarks Investigation 2: Sessions 1-2, 4-6 Containers and Cubes Investigation 1: Sessions 1-4 Investigation 2: Sessions 1-5 Investigation 3: Sessions 1-4 Investigation 4: Sessions 1-9</p>

Mathematics Standards	Correlation By Page Numbers Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.
Measurement, continued <ul style="list-style-type: none">d) area — square units; and e) temperature — Celsius and Fahrenheit units. Problems also will include estimating the conversion of Celsius and Fahrenheit units relative to familiar situations (water freezes at 0°C and 32°F, water boils at 100°C and 212°F, normal body temperature is about 37°C and 98.6°F).	References: <ul style="list-style-type: none">Mathematical Thinking at Grade 5<ul style="list-style-type: none">Investigation 1: Sessions 1-3Picturing Polygons<ul style="list-style-type: none">Investigation 3: Sessions 4-6Name That Portion<ul style="list-style-type: none">Investigation 1: Sessions 2-4Investigation 3: Sessions 2, 8 <p>For related content, students in Grade 5 explore a number line in the following activity:</p> <ul style="list-style-type: none">Between Never and Always<ul style="list-style-type: none">Ten Minute Math: Nearest Answer Number Line

Mathematics Standards	Correlation By Page Numbers
5.12 The student will determine an amount of elapsed time in hours and minutes within a 24-hour period.	Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard. Grade 5 students use “lifetime strips” to represent and compare ages; they use stories, graphs, and tables to represent changes in speed and position over time. References: Measurement Benchmarks Investigation 3: Sessions 1-3 Patterns of Change Investigation 2: Sessions 1-5 Ten-Minute Math: Graph Stories
5.13 The student will measure and draw right, acute, and obtuse angles and triangles, using appropriate tools.	References: Picturing Polygons Investigation 2: Sessions 4-9 Investigation 3: Sessions 1-3
Geometry 5.14 The student will classify angles and triangles as right, acute, or obtuse.	References: Picturing Polygons Investigation 2: Sessions 1-9 Investigation 3: Sessions 1-3

Mathematics Standards	Correlation By Page Numbers
<p>5.15 The student, using two-dimensional (plane) figures (square, rectangle, triangle, parallelogram, rhombus, kite, and trapezoid) will</p> <p>a) recognize, identify, describe, and analyze their properties in order to develop definitions of these figures;</p> <p>b) identify and explore congruent, noncongruent, and similar figures;</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Mathematical Thinking at Grade 5 Ten-Minute Math: Quick Images Picturing Polygons Investigation 1: Sessions 1-4 Investigation 2: Sessions 1-9 Investigation 3: Sessions 1-6 Building on Numbers You Know Ten-Minute Math: Quick Images</p> <p>References: Picturing Polygons Investigation 2: Sessions 4-7 Investigation 3: Sessions 4-6</p>

Mathematics Standards	Correlation By Page Numbers
<p>c) investigate and describe the results of combining and subdividing shapes;</p> <p>d) identify and describe a line of symmetry; and</p> <p>e) recognize the images of figures resulting from geometric transformations such as translation (slide), reflection (flip), or rotation (turn).</p>	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Mathematical Thinking at Grade 5 Ten-Minute Math: Quick Images Picturing Polygons Investigation 1: Sessions 1-4 Investigation 2: Sessions 1-9 Investigation 3: Sessions 1-6 Building on Numbers You Know Ten-Minute Math: Quick Images</p> <p>References: Picturing Polygons Investigation 2 Session 8 Session 9, page 79 Investigation 3: Session 4</p> <p>References: Picturing Polygons Investigation 2: Sessions 1-9 Investigation 3: Sessions 4-6</p>

<p>Mathematics Standards</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>5.16 The student will identify, compare, and analyze properties of three-dimensional (solid) geometric shapes (cylinder, cone, cube, square pyramid, and rectangular prism).</p>	<p>References: Containers and Cubes Investigation 1: Sessions 1-4 Investigation 2: Sessions 1-5 Investigation 3: Sessions 1-4 Investigation 4: Sessions 1-9 Data: Kids, Cats, and Ads Ten-Minute Math: Volume and Surface Area</p>
<p>Probability and Statistics</p> <p>5.17 The student will</p> <p>a) solve problems involving the probability of a single event by using tree diagrams or by constructing a sample space representing all possible results;</p>	<p>References: Between Never and Always Investigation 1: Sessions 1-7 Investigation 2: Sessions 1-5 Building on Numbers You Know Ten-Minute Math: What Is Likely?</p>

Mathematics Standards	Correlation By Page Numbers
<p>a) predict the probability of outcomes of simple experiments, representing it with fractions or decimals from 0 to 1, and test the prediction; and</p> <p>b) create a problem statement involving probability and based on information from a given problem situation. Students will not be required to solve the created problem statement.</p>	<p>References: Between Never and Always Investigation 1: Sessions 1-7 Investigation 2: Sessions 1-5 Building on Numbers You Know Ten-Minute Math: What Is Likely?</p> <p>References: Between Never and Always Investigation 1: Sessions 1-7 Investigation 2: Sessions 1-5 Building on Numbers You Know Ten-Minute Math: What Is Likely?</p>
<p>5.18 The student will, given a problem situation, collect, organize, and display a set of numerical data in a variety of forms, using bar graphs, stem-and-leaf plots, and line graphs, to draw conclusions and make predictions.</p>	<p>References: Data: Kids, Cats, and Ads Investigation 1: Sessions 1-4 Investigation 2: Sessions 1-3 Investigation 3: Sessions 1-4 Investigation 4: Sessions 1-3 Investigation 5: Sessions 1-5</p>

Mathematics Standards	Correlation By Page Numbers
5.19 The student will find the mean, median, mode, and range of a set of data.	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Students gain experience with measures of central tendency and dispersion as they find the median of a set of data and discuss the spread and clustering of data.</p> <p>References: Between Never and Always Investigation 1: Sessions 3-6 Data: Kids, Cats, and Ads Investigation 1: Sessions 1-4 Investigation 2: Session 1</p>
<p>Patterns, Functions, and Algebra</p> 5.20 The student will analyze the structure of numerical and geometric patterns (how they change or grow) and express the relationship, using words, tables, graphs, or a mathematical sentence. Concrete materials and calculators will be used.	<p>References: Mathematical Thinking at Grade 5 Investigation 2: Sessions 1-4 Picturing Polygons Investigation 3: Session 3 Name That Portion Investigation 2: Sessions 4-5 Building on Numbers You Know Investigation 1: Sessions 3-4 Patterns of Change Investigation 1: Sessions 1-4</p>

Mathematics Standards	Correlation By Page Numbers
<p>5.21 The student will</p> <ul style="list-style-type: none"> a) investigate and describe the concept of variable; b) use a variable expression to represent a given verbal quantitative expression involving one operation; and 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>References: Mathematical Thinking at Grade 5 Investigation 3: Sessions 2-4: Teacher Note, page 63 Building on Numbers You Know Investigation 1: Sessions 3-4 Investigation 2: Sessions 5-6, page 62 Investigation 5: Sessions 1-2</p> <p>References: Mathematical Thinking at Grade 5 Investigation 3: Sessions 2-4: Teacher Note, page 63 Building on Numbers You Know Investigation 1: Sessions 3-4 Investigation 2: Sessions 5-6, page 62 Investigation 5: Sessions 1-2</p>

Mathematics Standards	Correlation By Page Numbers
<p>c) write an open sentence to represent a given mathematical relationship, using a variable.</p>	<p>References: Mathematical Thinking at Grade 5 Investigation 3: Sessions 2-4: Teacher Note, page 63 Building on Numbers You Know Investigation 1: Sessions 3-4 Investigation 2: Sessions 5-6, page 62 Investigation 5: Sessions 1-2</p>
<p>5.22 The student will create a problem situation based on a given open sentence using a single variable.</p>	<p>References: Mathematical Thinking at Grade 5 Investigation 3: Sessions 2-4: Teacher Note, page 63 Building on Numbers You Know Investigation 1: Sessions 3-4 Investigation 2: Sessions 5-6, pages 62-63 Investigation 5: Sessions 1-2</p>

Other Criteria	Correlation By Page Numbers
<p>1. Materials emphasize the use of effective instructional practices and learning theory:</p> <ul style="list-style-type: none"> • Students are guided through problem-solving approaches. • Concepts are introduced through concrete experiences that use manipulatives and other technologies. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Grade 5 students using <i>Investigations in Number, Data, and Space</i> are guided through problem-solving approaches throughout the course as they carry out the investigations around which the curriculum is organized. For example, students create polygons with shape pieces; construct, apply, discuss, and evaluate mathematical definitions of polygons; draw polygons on coordinate grids, on and off the computer; and investigate similar and regular polygons.</p> <p>Grade 5 students using <i>Investigations in Number, Data, and Space</i> justify answers and the steps taken to solve problems with and without manipulatives and physical models throughout the course. Students use a wide variety of manipulatives, including cubes, tiles, balances, pattern blocks, geoblocks, tetronimoes, and snap cubes to model numbers, operations, patterns, and problem situations. They also create graphs, charts, drawings, and tables to organize information needed to solve a problem.</p>

Other Criteria	Correlation By Page Numbers
<ul style="list-style-type: none"> • Multiple opportunities are provided for students to develop and apply concepts through the use of calculators, computers, and other technologies. • Students use the language of mathematics including specialized vocabulary and symbols. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Ten of the 50 Curriculum Units (K-5) have software support with specific activities that use the software applications to develop and apply concepts. Calculators are used and should be available throughout Investigations activities to develop and apply concepts. Teacher Notes discussing this important mathematical tool are found in an early unit at each grade level.</p> <p>Students in Grades 5 using <i>Investigations in Number, Data, and Space</i> use mathematical language and notation to express and present ideas throughout the course. The Dialogue Box is a feature that appears with many investigations and contains the text of discussions between teachers and students in which the teacher encourages students to use the language of mathematics to present mathematical ideas precisely.</p>

Other Criteria	Correlation By Page Numbers
<ul style="list-style-type: none"> Students use a variety of representations (graphical, numerical, symbolic, verbal, and physical) to connect mathematical concepts. 	<p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p> <p>Grade 5 students using <i>Investigations in Number, Data, and Space</i> model problem situations and draw conclusions, using representations such as graphs, tables, or number sentences, throughout the course. Students choose between and among concrete materials and symbols, tables and graphs, drawings and diagrams, and computer models. For example, students draw pictures and write number sentences describing possible dimensions of rectangles with a fixed area. They create a table comparing the dimensions, perimeter, and area of different rectangles. They construct circle graphs to represent data from everyday situations. They display spinner results in line plots. They create an array of one million dots. They use paper strips and tables to model changes in age. They use a table and a line graph to model change in position over time. They create a table to model the effects of repeated doubling. They use a variety of tables and graphs to model information from a computer database about cats.</p>

<p>Other Criteria</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>2. Materials present content in an accurate, unbiased manner:</p> <ul style="list-style-type: none"> • Materials are relatively free of content and production errors (misspelled words, word omissions, incorrect answers). • Diverse groups (racial, ethnic, cultural, linguistic), males and females, people with disabilities, and people of all ages are represented appropriately. 	<p><i>Investigations in Number, Data, and Space</i> has copyrights and updates for 1998, and 2004. Misspelled words, word omissions, incorrect answers, etc. have been addressed and corrections made in these updates.</p> <p>The investigations are carefully designed to invite all students into mathematics – girls and boys, members of diverse cultural, ethnic, and language groups, and students with different strengths and interests. Problem contexts call on students to share experiences from their family, culture or community. The curriculum eliminates barriers that exclude some students from participating successfully in mathematics.</p>

<p>Other Criteria</p>	<p>Correlation By Page Numbers</p> <p>Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.</p>
<p>3. The mathematics content is significant and accurate:</p> <ul style="list-style-type: none"> • Materials are presented in an organized, logical manner which represents the current thinking on how students learn mathematics. • Materials are organized appropriately within and among units of study. • Format design includes titles, subheadings, and appropriate cross-referencing for ease of use. • Writing style, length of sentences, vocabulary, graphics, and illustrations are appropriate. 	<p>The TERC authors created this curriculum based on their own research of how children think about and best learn mathematics. The materials were field-tested 2-3 years to assure efficacy</p> <p>Each Curriculum Unit has a content focus and is comprised of a set of Investigations. Each Investigation is comprised of a carefully sequenced set of activities to develop students' mathematical thinking.</p> <p>The narrative lesson plan of each Investigation and each daily Class Session follow the same format K-5. What Happens and Mathematical Emphases, Activities, Class Discussions, Homework and Follow-Up are clearly labeled for ease of use.</p> <p>The text reading required by the student is minimized so as to focus attention on the mathematics. Any graphics and illustrations are provided to support the work of the student in the investigation.</p>

Other Criteria	Correlation By Page Numbers Make all correlations using the student text. Identify the five <i>most significant</i> correlations. Include correlations that address the introduction and development of each concept. Use each bullet of the standard in the context of the stem. Consult the 2002 Mathematics Curriculum Framework for further information about each standard.
<ul style="list-style-type: none"> • Level of abstraction is appropriate, and real life examples, including careers, are provided. • Sufficient applications are provided to promote depth of application. 	<p>The Investigations curriculum moves students appropriately from the concrete to representational to symbolic notation throughout the work of an investigation. Many investigations begin with a question about a real-world situation to solve.</p> <p>Each Curriculum Unit has a content focus for instruction and learning. Students may spend 2-7 weeks of inquiry, learning, practice and application of skills and understandings of mathematical ideas in the unit.</p>