

A Correlation of

SCOTT FORESMAN
Investigations
IN NUMBER, DATA, AND SPACE®

©2012



to the

**Common Core State Standards
for Mathematics**

Grade 3

A Correlation of Investigations in Number, Data, and Space, ©2012 to the Common Core State Standards for Mathematics

Introduction

This document demonstrates how *Investigations in Number, Data, and Space* ©2012 meets the indicators of the Common Core State Standards for Mathematics, Grade 3. Correlation references are to the unit number and are cited at the session level. This correlation includes Classroom Routines but does not include ongoing review in Daily Practice and Homework.

Investigations in Number, Data, and Space supports students in making sense of mathematics and becoming mathematical thinkers. The program is designed to help all elementary children understand the fundamental ideas underlying number and arithmetic, geometry, data, measurement, and algebraic thinking. Students are encouraged to reason mathematically, develop problem-solving strategies, and represent their thinking using models, diagrams, and graphs. In addition to engaging the range of math learners, *Investigations* communicates mathematics content and pedagogy to teachers, offering them greater support built into every lesson, so that all students are successful.

Each grade level consists of a set of units, presented through investigations that involve students in the exploration of major mathematical ideas. Students gain a greater understanding of math, with meaningful practice and review that result in computational fluency. They build a greater foundation for algebra that prepares them for the challenges in middle and high school math courses.

Approaching the mathematics content through investigations helps student develop flexibility and confidence in approaching problems, fluency in using mathematical skills and tools to solve problems, and proficiency in evaluating their solutions. Students also build a repertoire of ways to communicate about their mathematical thinking, while their enjoyment and application of mathematics grows.

New to the program for the Common Core State Standards

INVESTIGATIONS AND THE COMMON CORE STATE STANDARDS Resource Book contains:

- Overview of the Common Core State Standards and Investigations
- Alignment to the Standards for Mathematical Practice
- Correlation to the Standards for Mathematical Content
- Instructional Plan for each Unit
- New Teacher Material for each Unit
- Common Core Student Activity Black Line Masters

Curriculum Units

Grade 3

U1 Trading Stickers, Combining Coins

U2 Surveys and Line Plots

U3 Collections and Travel Stories

U4 Perimeter, Angles, and Area

U5 Equal Groups

ICCG: Investigations and the Common Core State Standards Guidebook

U6 Stories, Tables, and Graphs

U7 Finding Fair Shares

U8 How Many Hundreds? How Many Miles?

U9 Solids and Boxes

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Common Core State Standards for Mathematics Grade 3	Investigations in Number, Data, and Space, ©2012 Grade 3
Operations and Algebraic Thinking 3.OA	
Represent and solve problems involving multiplication and division.	
1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. [3.OA.1.]	U5 Sessions: 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.6, 4.7
2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. [3.OA.2.]	U5 Sessions: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7
3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. ¹ [3.OA.3.]	U5 Sessions: 1.1, 1.2, 1.3, 1.4, 2.3, 2.4, 2.5, 2.6, 3.1, 3.3, 3.4, 4.1, 4.2, 4.3, 4.5, 4.6, 4.7 U6 Sessions: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7 U7 Sessions: 1.1, 2.1 U8 Session: 3.5
4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. [3.OA.4.]	U5 Sessions: 1.3, 1.4, 2.6, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 U5 ICCG: 3.5A, 3.5B, 3.7A
Understand properties of multiplication and the relationship between multiplication and division.	
5. Apply properties of operations as strategies to multiply and divide. [3.OA.5.]	U5 Sessions: 1.4, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.6 U5 ICCG: 3.5A, 3.5B, 3.7A U6 Sessions: 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6 U7 Sessions: 1.2, 2.4
6. Understand division as an unknown-factor problem. [3.OA.6.]	U5 Sessions: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6

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Multiply and divide within 100.	
7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. [3.OA.7.]	U5 Sessions: 3.4, 3.6, 4.5, 4.6 U5 ICCG: 3.5A, 3.5B, 3.7A U6 Sessions: 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4 U7 Sessions: 1.2, 2.4 U7 ICCG: 1.4A U8 Session: 1.4
Solve problems involving the four operations, and identify and explain patterns in arithmetic.	
8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. <i>(This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations).)</i> [3.OA.8.]	U1 Sessions: 1.3, 1.4, 1.6, 1.7, 1.8, 2.3, 2.5, 2.7, 2.8 U3 Sessions: 1.4, 1.5, 2.1, 2.3, 2.4, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4 U5 Session: 4.5 U6 Sessions: 3.2, 3.3, 3.5, 3.7 U8 Sessions: 1.1, 1.2, 1.3, 1.4, 1.5, 2.3, 3.6, 3.7, 3.8, 3.9 U9 Sessions U9 ICCG: 4A.3
9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. [3.OA.9.]	U1 Sessions: 1.2, 1.4, 1.7, 2.2, 2.3, 2.6 U3 Sessions: 1.1, 1.5, 1.6, 2.3, 2.4, 2.5, 2.6, 2.7, 3.2, 3.3, 4.4 U5 Sessions: 1.3, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 4.1 U5 ICCG: 3.5A, 3.5B, 3.6, 3.7A U6 Sessions: 1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7 U8 Sessions: 1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9

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Number and Operations in Base Ten 3.NBT	
Use place value understanding and properties of operations to perform multi-digit arithmetic. (A range of algorithms may be used.)	
1. Use place value understanding to round whole numbers to the nearest 10 or 100. [3.NBT.1.]	U3 Sessions U3 ICCG: 1.7A U4 Sessions: 1.1, 1.2, 1.3, 1.4, 1.5, 2.4, 2.5, 3.2, 3.5, 3.6 U4 ICCG: 2.5A U6 Sessions: 2.2, 3.1, 3.3, 3.4 U7 Sessions: 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4 U7 ICCG: 1.4A, 1.4B, U9 Sessions: 2.1, 2.2, 2.3 U9 ICCG: 4A.1, 4A.2, 4A.3
2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. [3.NBT.2.]	U1 Sessions: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8 U3 Sessions: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 U4 Sessions: 1.1, 1.2, 1.3, 1.4, 1.5, 2.4, 2.5, 3.2, 3.5, 3.6 U4 ICCG: 2.5A U6 Sessions: 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4 U7 Sessions: 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4 U7 ICCG: 1.4A, 1.4B U8 Sessions: 1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9 U9 Sessions: 2.1, 2.2, 2.3 U9 ICCG: 4A.1, 4A.2, 4A.3
3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations. [3.NBT.3.]	U5 Sessions U5 ICCG: 3.7A
Number and Operations–Fractions * 3.NF	
<i>*Expectations in this domain are limited to fractions with denominators of 2, 3, 4, 6, and 8.</i>	
Develop understanding of fractions as numbers.	
1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$. [3.NF.1.]	U7 Sessions: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4

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2. Understand a fraction as a number on the number line; represent fractions on a number line diagram. [3.NF.2.]	
a. Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line. [3.NF.2.a.]	U7 Sessions U7 ICCG: 1.4A, 1.4B
b. Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line. [3.NF.2.b.]	U7 Sessions U7 ICCG: 1.4A, 1.4B
3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. [3.NF.3.]	
a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. [3.NF.3.a.]	U7 Sessions: 1.1, 1.2, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4 U7 ICCG: 1.4A, 1.4B
b. Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$). Explain why the fractions are equivalent, e.g., by using a visual fraction model. [3.NF.3.b.]	U7 Sessions: 1.5, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4
c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. [3.NF.3.c.]	U7 Sessions: 1.3, 2.1, 2.2, 2.3, 2.4, 3.4 U7 ICCG: 1.4A, 1.4B
d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model. [3.NF.3.d.]	U7 Sessions: 1.2, 1.3 U7 ICCG: 1.4B

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Measurement and Data 3.MD	
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.	
1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram. [3.MD.1.]	U3 Sessions: 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6 U3 ICCG: 1.7A U5 Sessions: 1.1, 1.2, 1.3, 1.4, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7 U5 ICCG: 3.1A U7 Sessions: 1.4, 1.5, 1.6, 3.1, 3.2, 3.3, 3.4
2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. <i>(Excludes compound units such as cm^3 and finding the geometric volume of a container. Excludes multiplicative comparison problems (problems involving notions of “times as much”).)</i> [3.MD.2.]	U9 Sessions U9 ICCG: 4A.1, 4A.2, 4A.3
Represent and interpret data.	
3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. [3.MD.3.]	U2 Sessions: 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.1, 2.2, 3.5 U2 ICCG: 2.3A
4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. [3.MD.4.]	U2 Sessions: 3.1, 3.2, 3.3, 3.4

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Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	
5. Recognize area as an attribute of plane figures and understand concepts of area measurement. [3.MD.5.]	
a. A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area. [3.MD.5.a.]	U4 Sessions: 2.2, 2.3, 2.4, 2.5, 2.6, 3.6 U4 ICCG: 2.5A
b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. [3.MD.5.b.]	U4 Sessions: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.6 U4 ICCG: 2.5A
6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units). [3.MD.6.]	U4 Sessions: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.6 U4 ICCG: 2.5A
7. Relate area to the operations of multiplication and addition. [3.MD.7.]	
a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. [3.MD.7.a.]	U4 Session: 2.4 U5 Sessions: 3.1, 3.2, 3.3, 3.4 U5 ICCG: 3.1A, 3.5A
b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. [3.MD.7.b.]	U4 Session: 2.4 U5 Sessions: 3.1, 3.3, 3.4, 3.6 U5 ICCG: 3.1A, 3.5A
c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. [3.MD.7.c.]	U5 Sessions U5 ICCG: 3.1A, 3.5A

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d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems. [3.MD.7.d.]	U4 Sessions: 2.3, 2.4, 2.5A, 2.5 U4 ICCG: 32.5A U5 Sessions U5 ICCG: 3.1A, 3.5A
Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	
8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. [3.MD.8.]	U4 Sessions: 1.2, 1.3, 1.4, 1.5 U4 ICCG: 2.5A
Geometry 3.G	
Reason with shapes and their attributes.	
1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. [3.G.1.]	U4 Sessions: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6
2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. [3.G.2.]	U7 Sessions: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4