![Investigations in Number, Data, and Space®]

Grade 5 Unit Summaries: 2nd Edition[1]

Number Puzzles and Multiple Towers: Multiplication and Division 1

In the first of two units about multiplication and division, students continue to develop and practice efficient strategies to solve multiplication problems both in and out of a context. Students refine and gain fluency in solving two-digit by two-digit multiplication problems, develop strategies for division problems with one- and two-digit divisors, and increase their knowledge of multiplication relationships by learning about prime factorization (e.g., $36 = 4 \times 9 = (2 \times 2) \times 9 = 2 \times 2 \times 3 \times 3$).

Prisms and Pyramids: 3-D Geometry and Measurement

Students investigate concepts of volume by finding the volume of prisms, pyramids, cylinders, and cones. They use patterns of open boxes and build prisms from cubes to develop a strategy for finding the volume of any rectangular prism. Using concrete materials, they also examine the 3-to-1 volume relationship between related (having the same base and height) prisms and pyramids, and related cylinders and cones. Geometry work includes naming geometric solids and their attributes.

Thousands of Miles, Thousands of Seats: Addition, Subtraction, and the Number System

Students study place value in large numbers by building a 10,000 chart and by adding multiples of 10 to and subtracting multiples of 10 from four- and five-digit numbers. Students finalize their study of subtraction by refining and gaining fluency in solving subtraction problems, including a study of the U.S. algorithm for subtraction. Using a context of the capacities of stadiums and arenas, they solve addition and subtraction problems involving four- and five-digit numbers. Students also demonstrate fluency with the division facts up to $144 \div 12$.

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[1] This document applies to the 2nd edition of *Investigations* (2008, 2012). See http://investigations.terc.edu/CCSS/ for changes when implementing *Investigations and the Common Core Standards*.

What's That Portion?: Fractions and Percents

Students study the relationship among fractions and between fractions and percents and use this knowledge to find equivalent fractions, order fractions, and add commonly used fractions. They use a variety of contexts and models, including area, number lines, and rotation, to further understand the meaning of fractions and model their strategies. This is the first of two units in Grade 5 about rational numbers.

Measuring Polygons: 2-D Geometry and Measurement

Students create polygons using "power polygon" pieces and discuss, apply, and evaluate definitions of these polygons. They focus on properties of quadrilaterals and also study similarity of 2-D shapes. Measurement work includes finding measures of angles using known angles and finding perimeter and area of rectangles.

LogoPaths, a *Logo* programming environment designed for *Investigations* students in Grades 3–5, is introduced in this unit. It allows students to explore geometrical relationships, especially focusing on angle, length and perimeter, patterns in sides and angles, and characteristics of specific shapes.

Decimals on Grids and Number Lines: Decimals, Fractions, and Percents

In this unit, students focus primarily on decimals and how the number system extends to numbers less than one. Students use their understanding of fractions and percents and their relationship to decimals to solve computation problems involving decimals. Students use contexts (time and precipitation) and models (area and number lines) to order and add decimals. This is the second of two rational number units in Grade 5.

How Many People? How Many Teams?: Multiplication and Division 2

In the second unit on multiplication and division, students find and study equivalent expressions for multiplication and division problems (e.g., $112 \div 8 = 28 \div 2$). Students practice solving larger multiplication problems (3 digit x 2 digit) accurately and efficiently and study the U.S. algorithm for multiplication. Students gain fluency solving division problems with one-, two-, and three-digit divisors.

Growth Patterns: Patterns, Functions, and Change

Students investigate situations in which two quantities change in relation to each other. Students describe data about functional relationships, develop an overall sense of change from a graph, and understand how the changes and totals are related. They also compare two linear functions with different rates of change.

How Long Can You Stand on One Foot?: Data Analysis and Probability

Students describe major features of a set of data, represented in a line plot or bar graph, and quantify the description by using medians or fractional parts of the data. Students draw conclusions about how two groups compare based on summarizing the data for each group. They conduct their own data experiment. Students also look at the probability of various events. They express the probabilities of the possible outcomes (e.g., landing on the green part of the spinner, landing on the white part of the spinner) by using numbers from 0 to 1. Then they conduct experiments to see what actually occurs. Students also consider the notion of fairness in the context of probability by playing fair and unfair games, that is, games in which players do or do not have equal chances of winning.