Investigations in Number, Data, and Space®

An Overview of Grade 5: 2nd Edition[1]

The fifth grade curriculum is organized into 9 units that offer from 2½ to 4½ weeks of work, focused on the area(s) of mathematics identified in the unit's subtitle. Because units build on each other, both within and across strands, they are designed for use in the sequence shown.

Unit Title	Number of Sessions
Number Puzzles and Multiple Towers Multiplication and Division 1	**22**
Prisms and Pyramids 3-D Geometry and Measurement	**16**
Thousands of Miles, Thousands of Seats Addition, Subtraction, and the Number System	**15**
What's That Portion? Fractions and Percents 1	**21**
Measuring Polygons 2-D Geometry and Measurement	**18**
Decimals on Grids and Number Lines Decimals, Fractions, and Percents	**18**
How Many People? How Many Teams? Multiplication and Division 2	**20**
Growth Patterns Patterns, Functions, and Change	**13**
How Long Can You Stand on One Foot? Data Analysis and Probability	**15**

Note that the *Investigations* curriculum assumes that each school day includes 70-75 minutes of math: one hour on the day's Session, and 10-15 minutes on Ten-Minute Math. Designed to fit within the calendar of a typical school year, fifth grade includes a total of 158 sessions (or approximately 32 weeks of work). This provides some leeway for going further with particular ideas and/or accommodating local circumstances. Although pacing will vary somewhat in response to variations in school calendars, needs of students, your school's years of experience with the curriculum, and other local factors, following the suggested pacing and sequence will ensure that students benefit from the way mathematical ideas are introduced, developed, and revisited across the year.

[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*.

An Overview of the Math in Fifth Grade*

Number and Operations: Whole Numbers Students practice and refine the strategies they know for addition, subtraction, multiplication, and division of whole numbers as they improve computational fluency and apply these strategies to solving problems with larger numbers. They expand their knowledge of the structure of place value and the base-ten number system as they work with numbers in the hundred thousands and beyond. By the end of the year, students are expected to know their division facts and to efficiently solve computation problems involving whole numbers for all operations.

Number and Operations: Fractions, Decimals, and Percents The major focus of the work with rational numbers is on understanding relationships among fractions, decimals, and percents. Students make comparisons and identify equivalent fractions, decimals and percents. They order fractions and decimals, and develop strategies for adding fractions and decimals to the thousandths.

Geometry and Measurement Students develop their understanding of the attributes of 2-D shapes, examine the characteristics of polygons, including a variety of triangles, quadrilaterals, and regular polygons. They also find the measure of angles of polygons. In measurement, students use standard units of measure to study area and perimeter and to determine the volume of prisms and other polyhedra.

Patterns and Functions Students examine, represent, and describe situations in which the rate of change is constant. They create tables and graphs to represent the relationship between two variables in a variety of contexts and articulate general rules using symbolic notation for each situation. Students create graphs for situations in which the rate of change is not constant and consider why the shape of the graph is not a straight line.

Data Analysis and Probability Work focuses on comparing two sets of data collected from experiments developed by the students. They represent, describe, and interpret this data. In their work with probability, students describe and predict the likelihood of events and compare theoretical probabilities with actual outcomes of many trials. They use fractions to express the probabilities of the possible outcomes.

Ongoing Review and Practice in Fifth Grade

Approximately 10 minutes per day is spent on one of six Ten-Minute Math activities, which offer practice and review of key concepts in place value, number and operations, data, and geometry.

Homework is provided 4-5 times a week. In addition, each session includes a page for Daily Practice that can be used either for additional homework or for in-class practice. The *Student Math Handbook* illustrates important words and ideas and can be used for review.

• **Note**: For more detailed information on the math at this grade level, see *Mathematics in Fifth Grade* and *Grade 5 Scope and Sequence* in *Implementing* Investigations *at Grade 5*.

Over the course of fifth grade, students…

- Solve number puzzles (e.g. "What number(s) is odd, greater than 50, a multiple of 15, and less than 100?") using their knowledge of number properties (odd, even, prime, square) and number relationships (factor and multiple).

- Study what happens to the dimensions of a rectangular prism when the volume is doubled.

- Solve addition and subtraction problems with large numbers, using the context of seats in a stadium. For example, if Grand Canyon Stadium has 73,521 seats and 62,106 people are seated, how many seats are empty?

- Compare 5/8 and 3/5 by using percents, representations, or reasoning about their relationship to the landmark fraction ½.

- Add fractions by playing *Roll Around the Clock*.

- Cut and rearrange paper rectangles to find several rectangles with different perimeters but the same area.

- Compare 0.25 and 0.3 using a 10 x 10 grid and a number line.

- Solve division problems by thinking about teams. For example, if there are 774 students and 24 people on a team, how many teams will there be? If you start by forming 20 teams, how many people still need to be on teams?

- Solve multiplication problems using an array, which shows the distributive property—63 x 24 = (60 x 20) + (60 x 4) + (3 x 24).

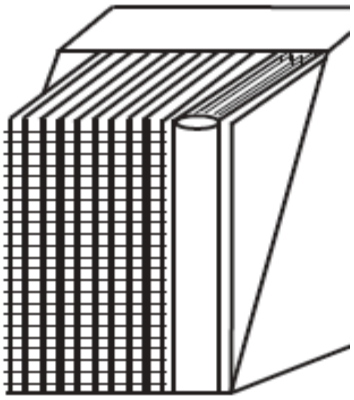
- Graph the height of the Fastwalker (an animal from the mythical planet of Rhomaar) and write a rule describing its growth.

- Design and carry out an experiment to determine which paper bridge design will hold the most weight, and then graph and analyze the results.

The Components

In order to teach the fifth grade curriculum, a teacher needs the Core Curriculum Package, Student Activity Books, and the fifth grade manipulatives. The following section describes all of the components available at fifth grade:

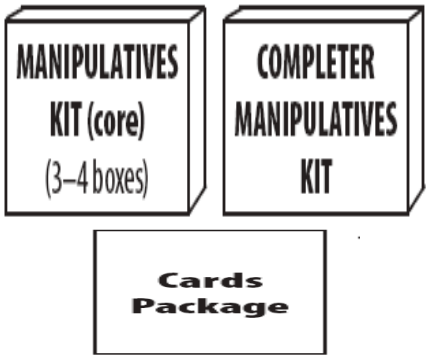
The **Core Curriculum Package** at Grade 5. This includes:



- the nine **curriculum units** listed above.
- ***Implementing* Investigations *in Grade 5***. This book helps teachers get started and provides useful ongoing support.
- **a Resources Binder.** Available in English or Spanish, this contains all of the transparencies and masters (e.g. assessment masters, game directions, family letters), in hard copy and on a CD. It also includes the *LogoPaths* software, used in the Grade 5 2-D Geometry unit and recommended for additional use throughout the year.

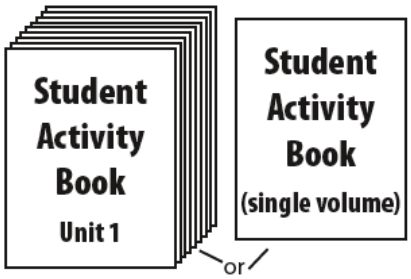
Also available separately: a **Spanish Teaching Companion** that presents vocabulary and teacher dialogue in Spanish, and an **Answer Key**.

There are three kits available for a class of 32 students:



- The Grade 5 **Manipulatives Kit** includes all of the student and overhead manipulatives needed to teach the fifth grade units.
- The Grade 5 **Completer Manipulatives Kit** includes only the materials that are new to the second edition.
- The Grade 5 **Cards Package** provides manufactured decks of the most-used card sets. (These can also be made from Masters in the Resources Binder.)

The following resources are available for students:



- **Student Activity Book(s)** for each student. Available by unit or for the whole year, this consumable resource contains all of the pages students need, including: activity sheets, recording sheets for math games, homework sheets, and practice pages. It is available in English or Spanish.
- **Student Math Handbooks** for each student and/or several for the classroom. This hardcover book, which illustrates math words and ideas and provides game directions, is also available online and in Spanish.