



# Investigations

in Number, Data, and Space®

## An Overview of Grade 1: 2<sup>nd</sup> Edition

The first grade curriculum is organized into 9 units that offer from 2 to 5 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
<b>How Many of Each?</b> Addition, Subtraction, and the Number System 1	<b>25</b>
<b>Making Shapes and Designing Quilts</b> 2-D Geometry	<b>16</b>
<b>Solving Story Problems</b> Addition, Subtraction, and the Number System 2	<b>25</b>
<b>What Would You Rather Be?</b> Data Analysis	<b>13</b>
<b>Fish Lengths and Animal Jumps</b> Measurement	<b>11</b>
<b>Number Games and Crayon Puzzles</b> Addition, Subtraction, and the Number System 3	<b>20</b>
<b>Color, Shape, and Number Patterns</b> Patterns and Functions	<b>15</b>
<b>Twos, Fives and Tens</b> Addition, Subtraction, and the Number System 4	<b>18</b>
<b>Blocks and Boxes</b> 3-D Geometry	<b>16</b>

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 the Classroom Routine. Designed to fit within the calendar of a typical school year, first grade includes a total of 159 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.

## An Overview of the Math in First Grade\*

**Number and Operations: Whole Numbers** Students have repeated practice with the counting sequence, develop strategies for accurately counting a set of up to 50 objects by ones, and begin to count by groups in meaningful ways. Much of the work focuses on addition and subtraction, and on developing an understanding of these operations. Students solve story problems, compose and decompose quantities in different ways, and add and subtract single-digit numbers. By the end of the year, students are expected to count on to combine two small quantities; to subtract one small quantity from another; and to be fluent with the two-addend combinations of 10.

**Geometry** Students identify, describe, draw, and compare 2-D and 3-D shapes. The 2-D work is particularly focused on identifying and describing triangles, while the 3-D work asks students to pay particular attention to identifying a shape's faces and corners. Students also explore the relationship between 2-D and 3-D shapes as they match 2-D representations to 3-D shapes or structures. The optional *Shapes* software extends and deepens the 2-D geometry work.

**Data Analysis** Students sort related objects according to a particular attribute and describe what distinguishes one group from another. They are introduced to, discuss, and compare standard forms of representation including picture graphs, tallies, charts, and bar graphs. They carry out their own data investigation, developing a question and then collecting, representing, describing and interpreting the data.

**Measurement** Students develop a foundation of skills for accurate linear measurement. They measure both objects and distances, explore what happens when something is measured with different sized units, and learn that when something is measured twice with the same unit, the same results should be obtained.

**Patterns and Functions** Students create, describe, extend, and make predictions about repeating patterns and analyze their structure by identifying the unit. Students also work with number sequences associated with repeating patterns, and consider situations that have a constant increase.

### Ongoing Review and Practice

10-15 minutes per day is spent on one of five Classroom Routines. *Start With/Get To* helps students develop fluency with the counting sequence, both forward and back. During *Morning Meeting*, students count to take attendance, use the calendar as a tool for keeping track of time and events, develop time-related vocabulary as they review the daily schedule, and describe and interpret data about the weather. *Quick Images* provides practice with building mental pictures of visual images such as 2-D shapes or arrangements of squares or dots. Introduced later in the year, *Tell a Story* helps students interpret and understand standard notation, and *Quick Surveys* provides a regular opportunity to collect, record, and discuss data about themselves.

Homework is provided approximately once 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 math words and ideas and can be used for review.

\* **Note:** For more detailed information on the math at this grade level, see *Mathematics in First Grade* and *Grade 1 Scope and Sequence in Implementing Investigations in Grade 1*.

## Over the course of first grade, students...

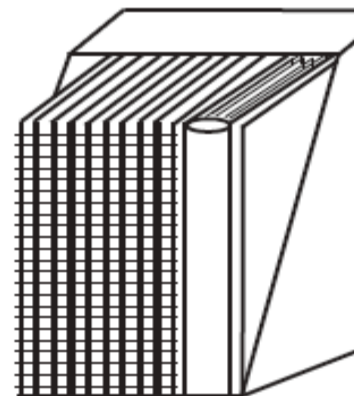
- Participate in *Start With/Get To*, a routine that involves using a number line to count forward or back from any number up to 100.
- Play games about counting, comparing, adding, and subtracting, including: *Collect 20*, *Compare & Double Compare*, *Five-in-a-Row*, *Roll and Record*, *Five-in-a-Row with Three Cards*, *Five-in-a-Row: Subtraction*, *Roll and Record: Subtraction*, *Ten Turns*.
- Solve problems like, “There are 7 vegetables on my plate. Some are peas and some are carrots. How many of each could I have?” and “There are 7 crayons. Some are red and some are blue. There are *more* red crayons. How many of each could there be?”
- Find combinations of numbers through How Many of Each? problems and activities like *Three Towers*, *Heads and Tails*, *How Many Am I Hiding?*, *Counters in a Cup*, and *Dot Addition*.
- Design and create paper quilts by repeating squares made of combinations of triangles and squares.
- Investigate the area of their feet by counting and comparing the number of tiles, pennies, and beans that it takes to cover an outline of their shoe.
- Cut a horizontal number line into rows of 10, to make a 100 chart.
- Collect and represent data about whether their peers would rather be an eagle or a whale, and about the ages of their classmates and their siblings.
- Measure paper fish to determine which are “keepers”.
- Solve problems like, “If the Penny Jar has 3 pennies in it, and we add 2 each day, how many pennies will we have after 5 days?”
- Investigate “Mystery Boxes” and use 2-D pieces to make 3-D boxes.
- Make 2-D drawings of 3-D objects such as Geoblocks or buildings.
- Make a Geoblock town and give directions through it (e.g. to get from the school to the library, go north 1 block and then 3 blocks east)
- Play games like *Make 10*, *Tens Go Fish*, *Ten Plus* that help them develop fluency with the combinations of 10.
- Begin to make sense of counting by groups through contexts (e.g. hands, fingers, and squares that come in 1s, 2s, and 5s) and games (e.g. *Roll Tens*) that involve equal groups.

## The Components

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

The **Core Curriculum Package** at Grade 1. This includes:

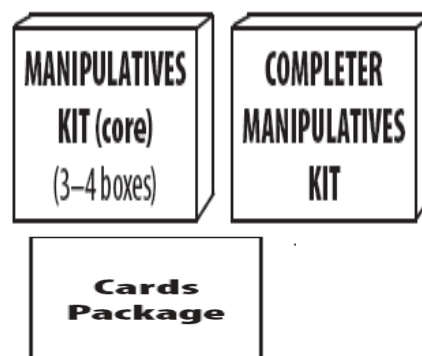
- the nine **curriculum units** listed above.
- **Implementing Investigations in Grade 1**. This book helps teachers get started and provides useful ongoing support.
- a **Resources Binder**. Available in English or Spanish, this contains all of the transparencies and masters (e.g. assessment masters, game directions, family letters), in hard copy and on a CD. It also includes the *Shapes* software, used in the Grade 1 2-D Geometry unit.



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 24 students:

- The Grade 1 **Manipulatives Kit** includes all of the student and overhead manipulatives needed to teach the first grade units.
- The Grade 1 **Manipulatives Completer Kit** includes only the materials that are new to the second edition.
- The Grade 1 **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 with perforated sheets 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, as a **Flip Chart**, and in Spanish.

