



Investigations

in Number, Data, and Space®

An Overview of Grade 2: 2nd Edition¹

The second grade curriculum is organized into 9 units that offer from 2 to 5 ½ 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
Counting, Coins, and Combinations Addition, Subtraction, and the Number System 1	27
Shapes, Blocks, and Symmetry 2-D and 3-D Geometry	19
Stickers, Number Strings, and Story Problems Addition, Subtraction, and the Number System 2	26
Pockets, Teeth, and Favorite Things Data Analysis	15
How Many Floors? How Many Rooms? Patterns, Functions, and Change	11
How Many Tens? How Many Ones? Addition, Subtraction, and the Number System 3	20
Parts of a Whole, Parts of a Group Fractions	10
Partners, Teams, and Paper Clips Addition, Subtraction, and the Number System 4	16
Measuring Length and Time Measurement	21

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, second grade includes a total of 165 sessions (or approximately 33 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 Second Grade*

Number and Operations: Whole Numbers Students transition to thinking and working with groups, explore the composition of numbers to 100, and develop an understanding of the base-10 structure of our number system. The bulk of the work focuses on or supports the development of fluency with the operations of addition and subtraction. By the end of the year, students are expected to be fluent with the addition combinations to $10+10$; to add 2 two-digit numbers accurately and efficiently; and to subtract two-digit numbers accurately.

Number and Operations: Fractions Students develop an understanding that fractions are equal parts of a whole, whether the whole is a single object or a set of objects. They work with halves, thirds, and fourths, including fractions greater than one, and learn what the numbers in fraction notation represent.

Geometry Students work with 2-D and 3-D shapes, with a particular focus on properties of rectangles and rectangular prisms. They are introduced to rectangular arrays (e.g. 2 rows of 3 squares), use them to find the area of rectangles, and develop an understanding of mirror symmetry. The optional *Shapes* software extends and deepens the work in each of these areas.

Patterns and Functions Students use tables to represent and explore situations with constant ratios (e.g. if 6 triangles cover a hexagon, how many triangles would cover 5 hexagons?). They also work with repeating patterns that provide an opportunity to think about odd and even numbers and what happens when you count by 3's starting at 1; starting at 2; starting at 3.

Data Analysis Students sort and classify objects and categorical data. They also work with numerical data, and see and use a variety of data representations including Venn diagrams, cubes towers, line plots, and student-created representations. They complete two data investigations and compare sets of data.

Measurement Students use direct comparison, indirect comparison, and linear units to measure and compare the lengths of different objects. They use nonstandard (e.g. cubes) and standard (e.g. inches, feet, centimeters) units of measure. Students also measure time as they practice naming, notating and telling time on digital and analog clocks. They use timelines to represent intervals of time and calculate elapsed time.

Ongoing Review and Practice

In Grade 2, 10-15 minutes per day is spent one of four Classroom Routines. Students learn and practice how to name, notate, and tell time on digital and analog clocks in *What Time Is It?*. They generate and discuss different expressions that equal a given number in *Today's Number*. *Quick Images* provides practice with building mental pictures of visual images such as 2-D shapes or arrangements of squares or dots. In *How Many Pockets?*, the class estimates and then determines the number of pockets student are wearing every tenth day.

Homework is provided 1-2 times a week at Grade 2. 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 in grade 2, see *Mathematics in Second Grade* and *Grade 2 Scope and Sequence* in *Implementing Investigations in Grade 2*.

Over the course of second grade, students...

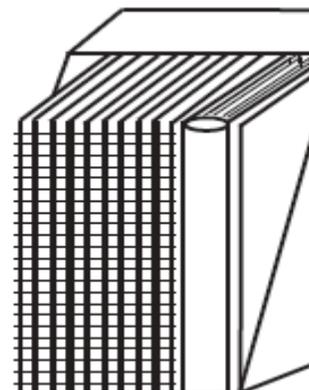
- Visit “Sticker Station”—which sells single stickers, strips of 10, or sheets of 100—as a way to develop an understanding of the base 10 place value system.
- Use cubes, the number line, the 100 Chart, coins, and stickers to represent quantities, to solve problems, and to develop and refine strategies for adding and subtracting two-digit numbers.
- Use addition and subtraction to solve “Enough for the Class?” problems.
- Use “Partners and Teams” as a context for investigating what makes numbers even and odd, and what happens when you add even and odd numbers.
- Play games about adding up to and subtracting from 100, such as *Collect \$1.00* and *Spend \$1.00* and *Roll-a-Square* and *Unroll-a-Square*.
- Figure out how to use 2-D rectangles of various sizes to make a 3-D box or rectangular prism.
- Collect, represent, and analyze data about “favorite things”, the number of teeth students have lost, and the number of pockets the class is wearing every tenth day.
- Solve problems about equal groups and ratio like, “If a building has 3 floors, each with 5 rooms, how many rooms does it have?”.
- Investigate fractions of an area as they explore real flags and design their own.
- Solve problems about sharing an object or a set of objects among a given number of friends.
- Learn to tell time to the quarter hour – on both analog and digital clocks.
- Write a letter to the King’s carpenter and visit “The Land of Inch” as they learn about standard units of measure.
- Use stories about two traveling cats, Fred & Winnipeg, to explore timelines and duration.

The Components

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

The **Core Curriculum Package** at Grade 2. This includes:

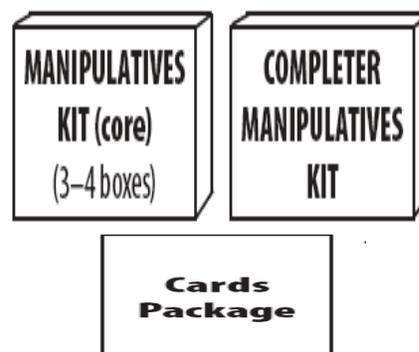
- the nine **curriculum units** listed above.
- **Implementing Investigations in Grade 2**. This book helps teachers get started and provides useful ongoing support.
- a **Resources Binder**. Available in English or Spanish, this contains all of the transparencies and masters (e.g. assessment masters,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



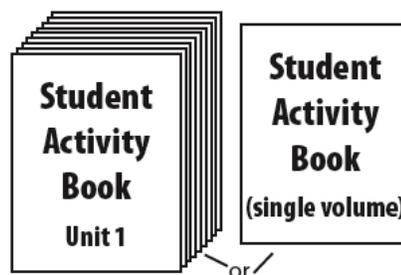
Also available separately: a Spanish Teaching Companion that presents vocabulary and teacher dialogue in Spanish, and an **Answer Key**.

There are three kits available for a class of 24 students:

- The Grade 2 **Manipulatives Kit** includes all of the student and overhead manipulatives needed to teach the second grade units.
- The Grade 2 **Manipulatives Completer Kit** includes only the materials that are new to the second edition.
- The Grade 2 **Cards Package** provides manufactured decks of the most-used card sets. (These can also be made from Masters in the Resources Binder.)



- **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.

