Grade 2

The big ideas in Grade 2 include

• extending understanding of the base-ten system;
• building fluency with addition and subtraction;
• solving problems using understanding of place value and properties of addition and subtraction.

This blueprint could start at any of the three units without prerequisites: 2.1 How Long is it?, 2.3 Multiples of a Hundred, and 2.6 Analyzing Shapes. We chose the first of these as the starting point to ensure that students have early access to the number line.

Students begin their work in second grade by measuring length in standard units and using the concept of length to represent whole numbers on the number line.
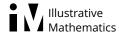
Next, they revisit the work they did in first grade with addition and subtraction, which maximizes the time students have to develop fluency with these operations. They use addition and subtraction to solve one- and two-step word problems, including word problems involving pennies and dimes, and word problems involving lengths measured in the same units.

Students build on foundations laid in Kindergarten and first grade to deepen their understanding of place-value. They extend their understanding of numbers into the hundreds and compare three-digit numbers based on how many hundreds, tens, and ones there are, and they add and subtract within 1000.

Next, students skip-count and work with equal sized sets in order to lay the foundations for work with multiplication in third grade. The purpose of the work that students do with shapes is to help lay the foundations for fractions and future work in geometry. In addition, partitioning circles into halves and fourths will help students tell time on an analog clock.

Note that this course blueprint is only one of many possible ways of arranging a sequence of topics designed to achieve the standards. It is a continually evolving document and we welcome your comments here.
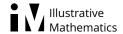
2.1 How Long is it?

In this unit students

- **use tools to measure length;**
- **estimate length;**
- **represent length measurements in a line plot;**
- **representing numbers on a number line.**

This unit focuses on measuring length in standard units and uses the concept of length to represent whole numbers on the number line. In Grade 1, students measured length using non-standard units. In Grade 2, students work with rulers, yardsticks, meter sticks, and measuring tapes in order to determine length. Students also use measurement of objects to create line plots.

Comment on this unit here.

Illustrative
Mathematics

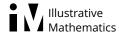# 2.2 Adding and Subtracting within 100.

In this unit students

- **work toward fluency with adding and subtracting within 100, mentally within 20;**
- **use number lines to represent sums and differences within 100;**
- **understand and explain addition and subtraction strategies;**
- **solve one- and two-step word problems, including word problems involving pennies and dimes, and using information represented in picture and bar graphs.**

In this unit students begin by revisiting the work they did in first grade with addition and subtraction. Working on addition and subtraction in the early part of the year maximizes the time students have to develop fluency with these operations (2.OA.B.2 and 2.NBT.B.5).

Students use number lines to represent sums and differences within 100, allowing them to develop a more abstract understanding of these operations. They add and subtract using strategies based on the properties of addition and the relationship between addition and subtraction. It is important for students to articulate and explain their addition and subtraction strategies.

Students solve one- and two-step word problems involving addition and subtraction, including problems with pennies and dimes, and problems with lengths measured in the same units.

Bar graphs and picture graphs support the major work of second grade by asking students to solve put-together and take-apart problems using information presented in graph(s). These are examples of how coherence builds across different domains within a single grade.

Comment on this unit here.
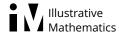
2.3 Multiples of a Hundred

In this unit students

- **understand hundreds, tens, and ones and skip count by 5s, 10s, and 100s;**
- **read and write numbers to 1000 and compare three digit numbers using symbols;**
- **develop and use addition and subtraction using strategies based on place value;**
- **mentally add and subtract 10 or 100 to multiples of 10 or 100;**
- **understand dollars as 100 pennies and 10 dimes.**

This unit focuses on place value. Building on foundations laid in Kindergarten and first grade, students extend their understanding of numbers into the hundreds. Developing conceptual understanding of place value is critical for success with addition and subtraction of larger numbers. Students understand that 10 tens are bundled to be 100. Counting extends to 1000, including skip counting by 5s, 10s, and 100s.

Students use the symbols <, >, and = to compare three-digit numbers based on the value of the hundreds, tens, and ones. They understand dollars as 100 pennies and 10 dimes and use money to support their growing understanding of place value.

Students work with mentally adding and subtracting 10 or 100 to decades and centuries.
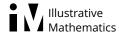
Comment on this unit here.

2.4 Adding and Subtracting within 1000

In this unit students

• **work toward fluency with adding and subtracting within 100, mentally within 20;**
• **mentally add and subtract 10 or 100 to any number;**
• **add and subtract within 1000 using strategies based on place value and properties of operations;**
• **understand and explain addition and subtraction strategies;**
• **solve one- and two-step word problems, including word problems involving dollars and cents.**

This unit circles back to addition and subtraction, extending this work to larger numbers. Building on units 2.2 and 2.3, students use strategies based on place value, properties of operations, and the relationship between addition and subtraction in order to add and subtract within 1000. Knowing the strategies is not enough; students must understand and explain their addition and subtraction strategies. The strategies students develop help them solve more sophisticated addition and subtraction problems, including ones with larger numbers, ones with more numbers (for example, adding four two-digit numbers instead of two), and word problems involving more than one step. Students continue to work toward fluency with adding and subtracting within 20 (mentally) and 100.

Comment on this unit here.

2.5 Working With Equal Groups

In this unit students

- **understand and reason about odd and even numbers;**
- **work with equal groups and rectangular arrays, using addition to find the total number of objects;**
- **partition rectangles into rows and columns of squares and count to find the total number of squares;**
- **understand nickels as groups of 5 pennies and quarters as groups of 5 nickels, and solve word problems involving money.**

In this unit students use skip counting and addition to find the total number of objects given equal-sized sets. They are introduced to the idea of odd and even numbers. They write equations that express the total as a sum of equal addends, for example, the equations 4 + 4 + 4 = 12 and 3 + 3 + 3 + 3 = 12 represent the total number of objects in an array with four rows and three columns. This is foundational for the work students will do with multiplication in third grade, where they synthesize this information and understand that this means the same as 3 x 4 = 12 and 4 x 3 = 12. Students also work to create their own arrays by partitioning rectangles into rows and columns of same-size squares, and then counting them to find the total.

Comment on this unit here.

2.6 Analyzing Shapes

In this unit students

- **recognize and draw shapes based on the number of sides or angles;**
- **partition circles and rectangles into equal shares;**
- **understand quarters as one-fourth of a dollar.**

In this unit students work with shapes in a way designed to lay the foundations for fractions and future work in geometry. They learn to draw and recognize shapes based on attributes such as number of angles, sides, or faces. These shapes include triangles, quadrilaterals, pentagons, hexagons, and cubes.

Students work with partitioning circles and rectangles into two, three, and four equal shares and use mathematical language such as half, third, half of, and third of to describe those shares. Partitioning circles into halves and fourths helps students tell time on an analog clock.

Comment on this unit here.

2.7 Telling Time

In this unit students use analog and digital clocks to tell and write time, understanding a.m and p.m.

Understanding and working with time are life skills. In this short unit students build on the work they did in first grade (tell and write time in hours and half-hours), in order to tell time to the nearest five minutes, with both digital and analog clocks. The concept of a.m. and p.m. are also introduced.

An alternative to this unit is to integrate expectations on telling time into other units.

Comment on this unit here.