Unit 4 Family Support Materials

From Hundredths to Hundred-Thousands

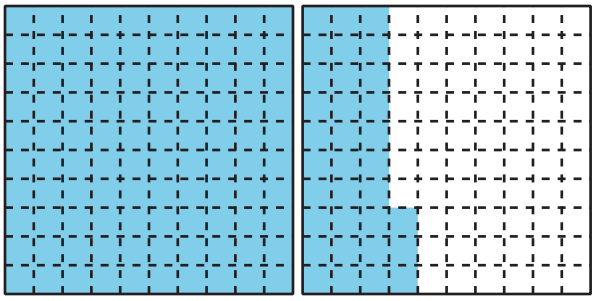
In this unit, students learn to express small and large numbers, from hundredths to hundred thousands. They learn to write tenths and hundredths, using decimal notation, and work with whole numbers within 1 million.

Section A: Decimals with Tenths and Hundredths

In this section, students relate the fraction $\frac{1}{10}$ to the notation 0.1 and $\frac{1}{100}$ to 0.01. They learn to read 0.1 as "one tenth" and 0.01 as "one hundredth."

To connect the fraction notation, decimal notation, and word name of a fraction, students reason with square diagrams that each represent 1 and are partitioned into hundredths.

The squares in this section are shaded from left to right, to reflect the digits in a decimal. For example, the number 1.33 is represented by shading a full large square that represents 1 whole, 3 columns in the next large square, and 3 small squares in the adjacent column.



The gridded square helps students see that $\frac{1}{10}$ (or 0.1) and $\frac{10}{100}$ (or 0.10) represent the same amount. It also allows students to recognize other tenths and hundredths that are equivalent.

Later in the section, students locate decimals on number lines. They compare decimals, based on size, and write comparison statements, using the symbols >, <, and =.

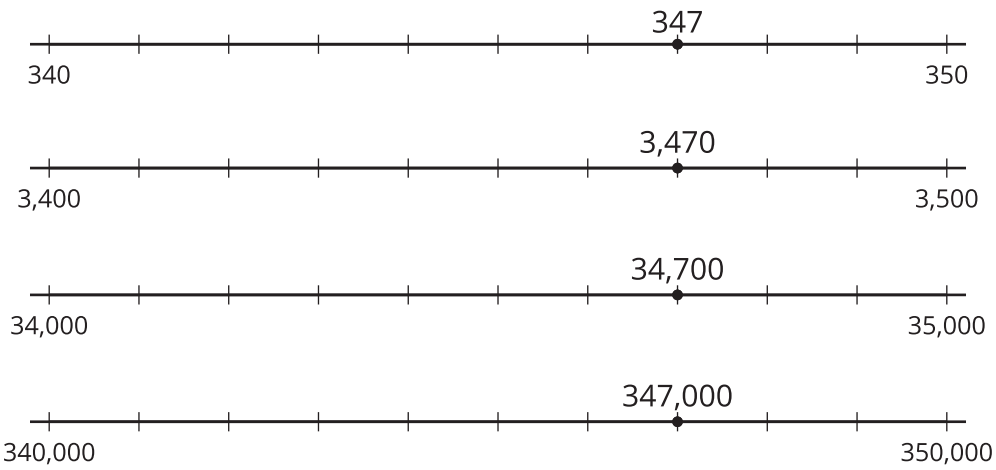
Section B: Place-Value Relationships through 1,000,000

In this section, students make sense of whole numbers up to the hundred thousands place. They use base-ten blocks and diagrams to represent large numbers.

Students come to understand the value of the digit in each place in a multi-digit number. They see that a digit in any given place has a value that is 10 times the value of the same digit in the place to its right.

For example, the 3 in 347,000 has a value 10 times that of the 3 in 34,700, because $300{,}000 = 10 \times 30{,}000$.

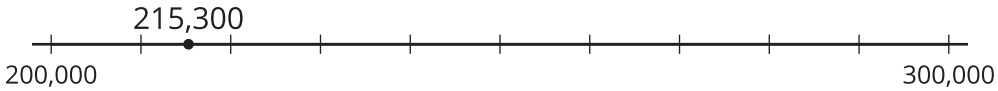
Students see the same relationship as they locate numbers on a number line. If the endpoints of a number line are each 10 times those on another number line, points that are in the same position on the two number lines are related by a factor of 10.



Section C: Compare, Order, and Round

In this section, students compare and round numbers within 1,000,000. To compare numbers, they think about the values of the digits and locate the numbers on a number line.

To round a number, students think about multiples of 10, 100, 1,000, 10,000, and 100,000 that are closest to the number. For example, 215,300 rounded to the nearest hundred thousand is 200,000. Students then solve problems involving large numbers in various situations.



Section D: Add and Subtract

In this section, students learn to use the standard algorithm for addition and subtraction. As in earlier grades, they think about composing (putting together) or decomposing (breaking apart) base-ten units to add and subtract.

To find the value of $17{,}375 + 14{,}024$, for example, students first may write each number in expanded form and then add the values in each place (ten thousands, thousands, hundreds, tens, ones). Later, they connect this way of adding to the standard algorithm for addition.

$$\begin{array}{rrrrrrrrrrr} & 10{,}000 & + & 7{,}000 & + & 300 & + & 70 & + & 5 & \\ + & 10{,}000 & + & 4{,}000 & + & 0 & + & 20 & + & 4 & \\ \hline & 20{,}000 & + & 11{,}000 & + & 300 & + & 90 & + & 9 & = \quad 31{,}399 \end{array}$$

$$\begin{array}{r} {\scriptstyle 1} \\ 17{,}375 \\ +\;\; 14{,}024 \\ \hline 31{,}399 \end{array}$$

Students start by finding sums that do not require composing a unit in any given place and progress towards those that require composing a unit multiple times.

Likewise, they start by subtracting numbers that don't require decomposing a unit and move towards differences that require multiple decompositions. Students practice adding and subtracting numbers both in and out of context.

$$\begin{array}{r} {\scriptstyle 9\;\;9} \\ {\scriptstyle 1\;\;\cancel{1}0\;\cancel{1}0\;15} \\ \cancel{2},\cancel{0}\cancel{0}\cancel{5} \\ -\;\; 1,436 \\ \hline 569 \end{array}$$

Try it at home!

Near the end of the unit, ask your fourth grader about the numbers 769,038 and 170,932:

- What is the value of the 7 in each number? Write a multiplication or division equation to show the relationship between the value of 7 in each number.
- Round each number to the nearest multiple of 1,000 and the nearest multiple of 100,000.
- Find the sum and the difference of the two numbers.

Questions that may be helpful as they work:

- How did you find your answer?
- How could you solve your problem in a different way?

Solution:

- The value of 7 in 769,038 is 700,000. The value of 7 in 170,932 is 70,000. $70,000 \times 10 = 700,000$ or $70,000 \div 10 = 700,000$.
- Rounded to the nearest multiple of 1,000: 769,000 and 171,000.
- Rounded to the nearest multiple of 100,000: 800,000 and 200,000.
- $769,038 + 170,932 = 939,970$
- $769,038 - 170,932 = 598,106$

Sample responses:

- I found my answer by looking at the place value of 7 in each number. I know that the hundred-thousands place is 10 times greater than the ten–thousands place.
- I rounded by finding the multiples of 1,000 closest to the number. I also can round numbers, using a number line.
- I added and subtracted, using the standard algorithm. I also can add or subtract, using expanded form.