

Family Math Newsletter

Grade 4 • Unit 4 – Applying place value concepts in whole number addition and subtraction

The Mathematics Involved

Place value and rounding

This unit explores the structure of our base-ten place value system. Students recognize the value of each place in our base-ten system is 10 times the value of the place to the immediate right. Therefore, when multiplying 274 by 10, each digit in 274 is shifted one place to the left.

Thousands	,	Hundreds	Tens	Ones
		5	7	4
5	,	7	4	0

x 10

Ten-Thousands	Thousands	,	Hundreds	Tens	Ones
			5	7	4
5	7	,	4	0	0

x 100

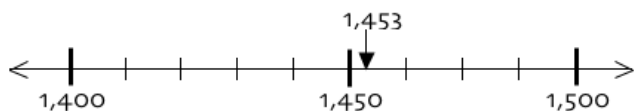
Additionally, students are expected to represent numbers up to 1,000,000 using the following methods:

- Using base-ten numerals – 287,016
- Using number names - two hundred eighty-seven thousand, sixteen
- Expanded form – $2 \times 100 \text{ thousand} + 8 \times 10 \text{ thousand} + 7 \times 1 \text{ thousand} + 1 \times 10 + 6 \times 1$.

Also, students compare numbers using the symbols $>$, $<$, $=$. For example:

$$287,016 > 28,716$$

Finally, students round numbers to any place. In order to round a number, students need to identify the benchmark numbers that surround the given number. For example, if a student is rounding 1,453 to the nearest hundred, the student first needs to identify the benchmark numbers in the hundreds that surround 1,453 and place them on a number line as shown.



The benchmark numbers are 1,400 and 1,500. Next, place the given number, 1,453 on the number line. Decide which hundred the given number is closest. In this case, 1,453 is closer to 1,500, so 1,453 rounded to the nearest hundred is 1,500.

Addition/Subtraction

During their year in fourth grade, students will become fluent in addition and subtraction using the standard algorithm. Since the primary grades, students have developed strategies based on place value to add and subtract numbers. The standard algorithm is a very efficient way to record addition or subtraction, but it is based on the strategies students have been using. Below a partial sum is compared to the standard algorithm – notice all of the digits are there. They are just located differently.

$\begin{array}{r} 673 \\ +159 \\ \hline 700 \text{ (600 + 100)} \\ 120 \text{ (70 + 50)} \\ +12 \text{ (3 + 9)} \\ \hline 832 \end{array}$	$\begin{array}{r} 11 \\ 673 \\ +159 \\ \hline 832 \end{array}$
--	--

With subtraction, students used place value understanding with base-ten blocks, and number lines (which can be used to count up). They will now transition to a more efficient subtraction algorithm. Since second grade students have been representing subtraction using base-ten blocks. This work can be easily recorded using the standards algorithm.

Subtraction: Decomposing where needed first

decomposing left to right,
1 hundred, then 1 ten

$$\begin{array}{r} 425 \\ -278 \\ \hline \end{array}$$

now subtract

$$\begin{array}{r} 425 \\ -278 \\ \hline 147 \end{array}$$

To increase fluency with addition and subtraction try the following games:

- Addition - Close to 1,000 <http://bit.ly/1fwQaMY>
- Subtraction – Close to 0 (Played the same as Close to 1,000. But subtract the two numbers getting a difference as close to zero as possible.)