Unit 3 Family Support Materials

Wrapping Up Addition and Subtraction within 1,000

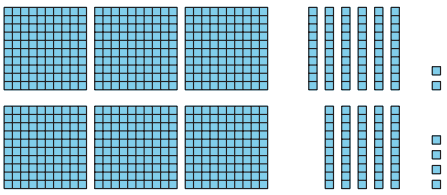
In this unit, students use their understanding of place value to round whole numbers and to add and subtract within 1,000. They also solve two-step problems.

Section A: Add within 1,000

In this section, students revisit numbers within 1,000 and consider ways to decompose (break apart) the numbers, based on place value (hundreds, tens, and ones). They start by using diagrams and strategies, learned in grade 2, to add and subtract numbers within 1,000. Then they make sense of *algorithms* (steps that work every time, no matter the numbers involved) that make adding more efficient.

For example, here are three ways to find the value of $362 + 354$:

using base-ten blocks or diagrams



using expanded form

$$\begin{array}{r} 300 + 60 + 2 \\ +\ 300 + 50 + 4 \\ \hline 600 + 110 + 6 \end{array}$$

recording partial sums vertically

$$\begin{array}{r} 362 \\ +\ 354 \\ \hline 6 \\ 110 \\ +\ 600 \\ \hline 716 \end{array}$$

Using the standard algorithm for addition is not required until grade 4. Students, who already know the standard algorithm, still need to make sense of the role of place value in the algorithm to support their work with decimals and fractions in future grades.

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Section B: Subtract within 1,000

In this section, students analyze and use algorithms for subtraction, while continuing to use base-ten blocks and diagrams to think about subtraction. They notice that it is difficult to use drawings to show a hundred decomposed or regrouped into tens (or a ten into ones), and that an algorithm is helpful.

Students make sense of a subtraction algorithm that uses expanded form to show how numbers are regrouped. This non-conventional notation allows students to see the meaning behind the digits above the numbers in the standard algorithm.

subtracting using expanded form

$$\begin{array}{rccccc} & \overset{400}{\cancel{5}00} & + & \overset{120}{\cancel{2}0} & + & 8 \\ - & 200 & + & 70 & + & 1 \\ \hline \end{array}$$

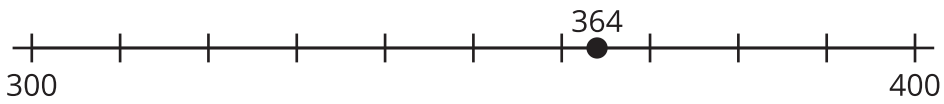
standard subtraction algorithm

$$\begin{array}{r} \overset{4}{\cancel{5}}\ \overset{12}{\cancel{2}}\ 8 \\ -\ 2\ 7\ 1 \\ \hline \end{array}$$

As with addition, the standard algorithm for subtraction is not expected until grade 4. The work here focuses on making sense of the regrouping that sometimes is required when we subtract.

Section C: Round within 1,000

In this section, students learn to round whole numbers to the nearest ten or hundred, using number lines. For example, they can see that for 364, the nearest ten (or multiple of 10) is 360, and the nearest hundred (or multiple of 100) is 400.

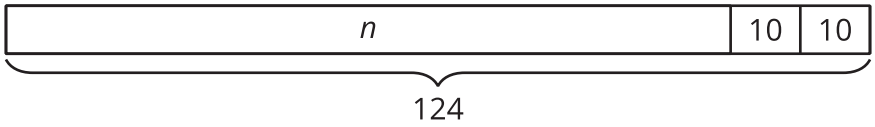


Section D: Solve Two-Step Problems

In this section, students apply their work with addition, subtraction, and multiplication to solve problems that require two steps, such as:

Mai had some beads. She buys 2 packs of beads. Each pack has 10 beads in it.
Now she has 124 beads. How many beads did Mai have before she bought the packs?

Students analyze tape diagrams that could represent the relationships in given situations and write corresponding equations to represent them. Previously, they worked with diagrams and equations with "?" or "___" to represent an unknown. Now, students interpret and write letters to stand for an unknown number.



$$124 - (2 \times 10) = n$$

Try it at home!

Near the end of the unit, ask your third grader to find answers to these problems, using an algorithm of their choice:

- $293 + 592$
- $728 - 384$

Questions that may be helpful as they work:

- Can you explain the steps in your algorithm?
- Does your answer make sense? How do you know?
- Can you round your answer to the nearest multiple of 10? To the nearest multiple of 100?

Solution:

- 885
- 344

Sample response:

- For the addition expression, I used partial sums to add. I added the ones together, then I added the tens, and then I added the hundreds. Lastly, I added each of the partial sums together to get my answer. For the subtraction expression, I used expanded form to subtract. I subtracted the ones, then the tens, and then the hundreds. When I subtracted the tens, I needed to decompose a hundred. Lastly, I added each of the differences together to get my answer.
- For the addition expression, I know my answer makes sense because 293 is close to 300 and 592 is close to 600. 300 plus 600 is equal to 900. My answer is close to 900. For the subtraction expression, I know my answer makes sense because 728 is close to 700 and 384 is close to 400. 700 minus 400 is equal to 300. My answer is close to 300.
- 885 rounded to the nearest multiple of 10 is 890 and to the nearest multiple of 100 is 900. 344 rounded to the nearest multiple of 10 is 340 and to the nearest multiple of 100 is 300.