



## Unit Plan

## 3.3 Wrapping Up Addition and Subtraction to 1,000

Chester / Littleville Elementary / Grade 3 / Mathematics

Week 10 - Week 14 | 4 Curriculum Developers | Last Updated: Mar 19, 2024 by LeBlanc, Deanna

[Style Guide](#)

## What is the purpose of the unit? What are the major take-aways?

## Standards

**MA: Mathematics (2017)****MA: Grade 3****Operations & Algebraic Thinking**

3.OA Understand properties of multiplication and the relationship between multiplication and division.

- 5. Apply properties of operations to multiply. [Show Details](#)

3.OA Multiply and divide within 100.

- 7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that  $8 \times 5 = 40$ , one knows  $40 \div 5 = 8$ ) or properties of operations. By the end of Grade 3, know from memory all products of two single-digit numbers and the related division facts. For example, the product  $4 \times 7 = 28$  has related division facts  $28 \div 7 = 4$  and  $28 \div 4 = 7$ .

3.OA Solve problems involving the four operations, and identify and explain patterns in arithmetic.

- 8. Solve two-step word problems using the four operations for problems posed with whole numbers and having whole number answers. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. [Show Details](#)
- 9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. [Show Details](#)

**Number & Operations in Base Ten**3.NBT Use place value understanding and properties of operations to perform multi-digit arithmetic. [Show Details](#)

- 1. Use place value understanding to round whole numbers to the nearest 10 or 100.
- 2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

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## Enduring Understandings

- Fluently add within 1,000 using algorithms based on place value and properties of operations.
- Use place value understanding to compose and decompose numbers.
- Fluently subtract within 1,000 using algorithms based on place value, properties of operations, and the relationship between addition and subtraction.
- Round whole numbers to the nearest multiple of 10 and 100.

## Essential Questions

1. How can we use what we know about addition and subtraction to help us understand multiplication and division?
2. How can understanding the properties of operations improve our ability to multiply numbers effectively?
3. Why is it important to be able to multiply and divide numbers fluently within 100, and how can this skill support other

- Assess the reasonableness of answers.
- Solve two-step word problems using addition, subtraction, and multiplication.

mathematical operations?

4. When we multiply two numbers together, how do we know what the related division facts are?

5. How can we apply different strategies, such as using the relationship between multiplication and division or using properties of operations, to solve multiplication and division problems more efficiently?

6. How can identifying patterns in the addition table or multiplication table help us to understand and memorize our multiplication and division facts?

7. In what ways can the concept of rounding to the nearest 10 or 100 help us estimate the results of addition or subtraction problems?

8. How can we use equations with an unknown quantity, represented by a letter, to model and solve two-step word problems?

9. What strategies can we use to check the reasonableness of our answers in addition, subtraction, multiplication, or division problems?

10. Why is it useful to be able to estimate math problems using rounding, and how does it help us with mental computation?

## Content

In this unit, students work toward the goal of fluently adding and subtracting within 1,000. They use mental math strategies developed in grade 2 and learn algorithms based on place value. In grade 2, students added and subtracted within 1,000 using strategies based on place value, properties of operations, and the relationship between addition and subtraction. When students combine hundreds, tens, and ones, they use place value understanding. When they decompose numbers to add or subtract, they rely on the commutative and associative properties. When students count up to subtract, they use the relationship between addition and subtraction. To move toward fluency, students learn a few different algorithms that work with any numbers and are generalizable to larger numbers and decimals. Students work with a variety of algorithms, starting with those that show expanded form, and moving toward algorithms that are more streamlined and closer to the standard algorithm.

$$\begin{array}{r}
 300 + 30 + 7 \\
 + 200 + 30 + 6 \\
 \hline
 500 + 60 + 13
 \end{array}$$
  

$$\begin{array}{r}
 500 + \cancel{70} + \cancel{7} \\
 - 200 + 30 + 6 \\
 \hline
 300 + 30 + 7
 \end{array}$$

Students explore various algorithms but are not required to use a specific one. They should, however, move from strategy-based work of grade 2 to algorithm-based work to set the stage for

## Skills

### Section A Goals

- Fluently add within 1,000 using algorithms based on place value and properties of operations.
- Use place value understanding to compose and decompose numbers.

### Section B Goals

- Fluently subtract within 1,000 using algorithms based on place value, properties of operations, and the relationship between addition and subtraction.

### Section C Goals

- Round whole numbers to the nearest multiple of 10 and 100.

### Section D Goals

- Assess the reasonableness of answers.
- Solve two-step word problems using addition, subtraction, and multiplication.

using the standard algorithm in grade 4. If students begin the unit with knowledge of the standard algorithm, it is still important for them to make sense of the place-value basis of the algorithm.

Understanding of place value also comes into play as students round numbers to the nearest multiple of 10 and 100. Students do not need to know a formal definition of “multiples” until grade 4. At this point, it is enough to recognize that a multiple of 10 is a number called out when counting by 10, or the total in a whole-number of tens (such as 8 tens). Likewise, a multiple of 100 is a number called out when counting by 100, or the total in a whole-number of hundreds (such as 6 hundreds). Students use rounding to estimate answers to two-step problems and determine if answers are reasonable.

Throughout the unit

In the first part of the unit, the focus of the warm-ups is on the use of place value to support the work with addition and subtraction. Students use strategies based on place value and properties of operations to add and subtract within 1,000.

Later in the unit, students come back to multiplication and build on the work of multiplying by 2, 5, and 10. Students apply properties of operations as strategies to multiply and represent these strategies using visual representations and expressions.

This work prepares students to solve two-step word problems using addition, subtraction, and multiplication at the end of the unit.

Here is a sampling of the Number Talk warm-ups in the unit.

lesson 3	lesson 8	lesson 12
200+40+7		
50+300+2	400-200	2×6
40+600+12	450-200	3×6
500+7+130	450-205	2×7
	450-215	3×7

## How will you gauge student learning?

### Assessments

#### 3.3 End of Unit Assessment | Summative | Written Test

[Grade3-3-End-of-Unit-Assessment-assessment.pdf](#)

[4 State Standards Assessed](#)

## How will students learn?

### Learning Activities

Section A:

Students begin this section by revisiting the idea of place value, reasoning about different ways to decompose numbers within 1,000, and using familiar strategies from grade 2 to add and subtract within 1,000.

From there, they progress toward more abstract addition strategies, but ones that are still based on place value. To support this progression toward algorithms, students use base-ten blocks or diagrams, express numbers in expanded form, and rely on their understanding of properties of operations. For example, here are three ways to add  $362+354$  and  $354$ :

The image shows three methods for adding 362 + 354:

- Base-ten blocks:** The top row shows 3 hundreds flats, 6 tens rods, and 2 units cubes. The bottom row shows 3 hundreds flats, 5 tens rods, and 4 units cubes. The result is 7 hundreds flats, 1 ten rod, and 6 units cubes.
- Expanded form:**

$$300 + 60 + 2$$

$$+ 300 + 50 + 4$$

$$\hline 600 + 110 + 6$$
- Standard algorithm:**

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

Students look for and make use of structure as they relate the compositions of numbers, expressions, and base-ten blocks or diagrams to find sums and differences (MP7).

Section B:

In this section, students analyze and use subtraction algorithms. They begin by using base-ten blocks and diagrams to subtract numbers. Because it is difficult to record regrouping using drawings, however, they see algorithms as a helpful way to find differences. As is the case with addition, students first make sense of a subtraction algorithm that uses expanded form, which allows them to see how the hundreds and tens are decomposed into smaller units.

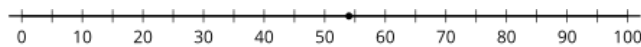
$$\begin{array}{r} 400 \quad 120 \\ \cancel{500} + \cancel{20} + 8 \\ - 200 + 70 + 1 \\ \hline \end{array}$$

This non-conventional notation allows students to see the meaning behind the digits used above the numbers in the standard algorithm.

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

Section C:

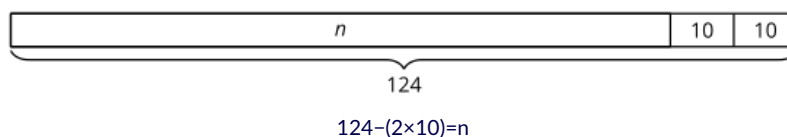
In this section, students learn the conventions of rounding whole numbers to the nearest multiple of 10 or 100. This work relies on and reinforces their understanding of place value. Number line diagrams are used to help students think about the multiple of 10 or 100 to which a given number is closest.



Students learn that when we find the nearest multiple of 10 or 100, we are rounding “to the nearest ten” or rounding “to the nearest hundred.” They also see that rounding a number to the nearest ten and nearest hundred can produce the same result. Students explore how rounding to the nearest ten or hundred can change the estimate of a sum. This prepares them to use rounding to see if solutions to problems are reasonable in the next section.

Section D:

In this section, students encounter more complex problems, think about the reasonableness of their answers, and use rounding to make estimates. 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 a ? or \_\_\_ to represent an unknown. Now, students interpret and write letters to stand for an unknown number.



Finally, students apply what they've learned about adding and subtracting within 1,000 to solve two-step word problems that involve multiplication, addition, and subtraction.

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Differentiated Instruction

Technology Integration

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21st Century Skills

Positive Behavior

CASEL

Collaborative for Academic, Social, and Emotional Learning

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Resources

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Teacher Notes and Reflections

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