Use place value understanding and properties of operations to perform multi-digit arithmetic. A range of algorithms may be used (Standards 3.NBT.1–3).

**Standard 3.NBT.1** Use place value understanding to round whole numbers to the nearest 10 or 100.

Concepts and Skills to Master

- Use place value understanding to round two-digit and three-digit numbers to the nearest 10
- Use place value understanding to round two-digit and three-digit numbers to the nearest 100
- Understand when rounding to the nearest 10 or 100, the goal is to approximate the closest number with zero ones or zero tens and ones (For example, 478 rounded to the nearest ten is 480; and 478 rounded to the nearest hundred is 500)
- Connect rounding numbers to the location of the number on a number line by identifying the benchmark numbers and using the midpoint to determine which benchmark number is closer (For example, when rounding 478 to the nearest ten, the benchmark numbers are 470 and 480. The midpoint is 475. The number 478 is to the right of the midpoint and closer to 480 than 470. The number 478 is therefore rounded to 480.)

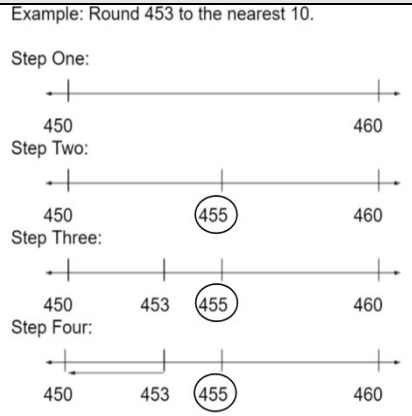
Teacher Note: Third grade is the first time students round numbers. Rounding to the unit represented by the place farthest to the left is typically easier for students and is often sufficient for practical purposes. Rounding to the unit represented by a place in the middle of a number may be more difficult for students as the surrounding digits are sometimes distracting. For example, it may be easier for a student to round 478 to 500 rather than to 480. Students should have experience rounding three-digit numbers to both the nearest 10 and nearest 100.

| Related Standards: Current Grade Level | Related Standards: Future Grade Levels |
|---|---|
| **3.OA.8** Solve two-step word problems and assess the reasonableness of answers using mental computation and estimation strategies including rounding | **4.NBT.3** Use place value understanding to round multi-digit whole numbers to any place up to 1,000,000<br>**4.OA.3** Solve multi-step word problems and assess the reasonableness of answers using mental computation and estimation strategies including rounding<br>**5.NBT.4** Use place value understanding to round decimals to hundredths |

Critical Background Knowledge from Previous Grade Levels

- Read and write numbers to 1,000 using base-ten numerals, number names, and expanded form (2.NBT.3)
- Understand that the three-digits of a three-digit number represent amounts of hundreds, tens, and ones. Understand the value of each digit in three-digit numbers (2.NBT.1)
- Understand that the two-digits of a two-digit number represent amounts of tens, and ones. Understand the value of each digit in two-digit numbers (1.NBT.2)

Suggested Models




Academic Vocabulary

round, benchmark number, midpoint, digits, estimate, close to, nearest ten, tens place, nearest hundred, hundreds place

Suggested Strategies

- Create and use horizontal and vertical open number lines to identify, locate, and label benchmark numbers, midpoints, and target numbers to assist in rounding
- Use base-ten blocks and drawings to model the concept of rounding
- Use a hundreds chart or place value chart as tools for support when rounding
- While songs and mnemonic stories may be engaging, they should not be used in place of developing conceptual understanding of rounding; If these are to be used, they should come after conceptual understanding has been developed

Use place value understanding and properties of operations to perform multi-digit arithmetic. A range of algorithms may be used (Standards 3.NBT.1–3).

**Standard 3.NBT.2** Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Concepts and Skills to Master

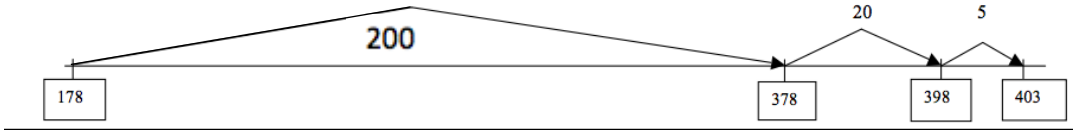
- Add and subtract fluently within 1,000 using strategies based on place value
- Use multiple strategies and algorithms fluently to add and subtract within 1,000
- Explain why addition and subtraction strategies work when adding and subtracting within 1,000
- Identify when it is necessary to compose (regroup) or decompose (ungroup) a ten or hundred
- Decompose a ten to subtract a two-digit number from a two- or three-digit number
- Decompose a hundred to subtract a three-digit number from a three-digit number
- Write equations for addition and subtraction with sums and differences within 1,000
- Understand how to compute sums and difference in a variety of situations, including with zeros in various places
- Understand and use the commutative property and associative property when adding and subtracting
- Understand the inverse relationship between addition and subtraction to fluently add and subtract within 1,000

Teacher Note: This standard builds on students work with 2.NBT.7, where students operate with values within 1,000. In third grade, students should become more fluent in these operations. The standard algorithm of compose and decompose is neither an expectation nor a focus in third grade. Students use multiple strategies for addition and subtraction in grades K-3. By the end of third grade students use a range of algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction to fluently add and subtract within 1000. Students are expected to fluently add and subtract multi-digit whole numbers using the standard algorithm by the end of fourth grade.

| Related Standards: Current Grade Level | Related Standards: Future Grade Levels |
|---|---|
| **3.OA.8** Solve two-step word problems<br>**3.OA.9** Identify arithmetic patterns (including patterns in the addition table or multiplication table) explain them using properties of operations. | **4.OA.3** Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted<br>**4.NBT.4** Fluently add and subtract multi-digit whole numbers using the standard algorithm |

Critical Background Knowledge from Previous Grade Levels

- Fluently add and subtract within 20 (2.OA.2)
- Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction (2.NBT.5)
- Add and subtract within 1,000 using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, and ones and ones, and that it is sometimes necessary to compose or decompose tens or hundreds (2.NBT.7)
- Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900 (2.NBT.8)
- Explain why addition and subtraction strategies work, using place value and the properties of operations. Explanations may be supported by drawings or objects (2.NBT.9)
- Apply properties of operations as strategies to add and subtract (1.OA.3)

| Academic Vocabulary | |
|---|---|
| compare, digits, expanded form, place value, standard form, word form, addends, sum, commutative (order) property of addition, identity (zero) property of addition, associative property of addition (grouping), fact family, difference, equation | |
| Suggested Models | Suggested Strategies |
| Example: There are 178 fourth graders and 225 fifth graders on the playground. What is the total number of students on the playground?<br><br>Student 1:<br>100 + 200 = 300 70 + 20 = 90 8 + 5 = 13 300 + 90 + 13 = 403 students<br><br>Student 2:<br>I added 2 to 178 to get 180. I added 220 to get 400. I added the 3 left over to get 403.<br><br>Student 3: I know the 75 plus 25 equals 100. I then added 1 hundred from 178 and 2 hundreds from 275. I had a total of 4 hundreds and I had 3 more left to add. So I have 4 hundreds plus 3 more which is 403.<br><br>Student 4:<br>178 + 225 = ?<br>178 + 200 = 378<br>378 + 20 = 398<br>398 + 5 = 403<br>  <br> | • Use hundreds chart to add and subtract<br>• Use base ten blocks to add and subtract<br>• Use an open number line to add and subtract<br>• Use physical models to add and subtract<br>• Use place value charts to add and subtract<br>• Use mental computation to develop conceptual understanding and number sense adding and subtracting two and three digit numbers |
| Images Source: http://www.dpi.state.nc.us/docs/curriculum/mathematics/scos/2.pdf | |

Use place value understanding and properties of operations to perform multi-digit arithmetic. A range of algorithms may be used (Standards 3.NBT.1–3).

**Standard 3.NBT.3** Multiply one-digit whole numbers by multiples of 10 in the range 10–90 *(for example, 9 x 80 and 5 x 60)* using strategies based on place value and properties of operations.

Concepts and Skills to Master

- Recognize when a number is a multiple of 10
- Represent the product of a one-digit number multiplied by a multiple of ten as groups of tens (Represent 3 × 50 as 3 groups of 5 tens, which is 15 tens or 150)
- Use the associative and/or distributive property of multiplication to explain the patterns when multiplying by multiples of ten (3 × 50 = 3 × (5 × 10) = (3 × 5) × 10 = 15 × 10 = 150)
- Generalize what happens when a one-digit number is multiplied by a multiple of ten (the non-zero digits appear to shift to the left with a zero in the ones place)

Teacher Note: This is an introductory year for multiplication. Third grade students work with understanding multiplication in the OA standards. This standard supports relating multiplication and place value. In fourth grade, students work with multi-digit multiplication using strategies based on place value (4.NBT.5).

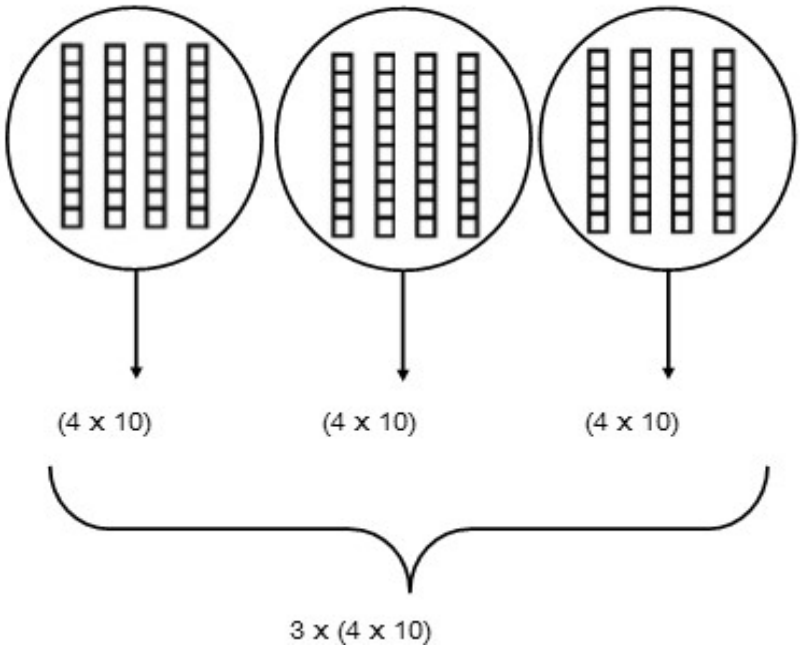
| Related Standards: Current Grade Level | Related Standards: Future Grade Levels |
|---|---|
| **3.OA.1** Interpret the products of whole numbers, such as interpreting 5 × 7 as the total number of objects in 5 groups of 7 objects each<br>**3.OA.3** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities<br>**3.OA.5** Apply properties of operations as strategies to multiply and divide<br>**3.OA.7** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations. By the end of third grade, know from memory all products of two one-digit numbers | **4.NBT.1** Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right<br>**4.NBT.5** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers<br>**5.NBT.1** Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left<br>**5.NBT.2** Explain patterns in the number of zeros of the product when multiplying a number by powers of 10<br>**5.NBT.5** Fluently multiply multi-digit whole numbers using the standard algorithm |

Critical Background Knowledge from Previous Grade Levels

- Related Standards: Current Grade Level (see above)
- Skip-count by tens within 1,000 (2.NBT.2)
- Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900 (2.NBT.8)
- Given a two-digit number, mentally find 10 more than the number (1.NBT.5)

Academic Vocabulary

multiplication, factor, product, equal groups, array, multiple of 10, place value

| Suggested Models | Suggested Strategies |
| --- | --- |
| Example: Model 3 x 40 with base-ten blocks.<br>  <br> | • Use a variety of strategies to represent multiplication (base-ten blocks, drawings, equal groups, arrays, area models, number lines, and/or hundreds charts)<br>• Extend strategies for one-digit factors to multiply with groups of tens<br>• Use open number lines (4 x 20 - make jumps at 20, 40, 60, 80)<br>• Discuss patterns and make generalizations |