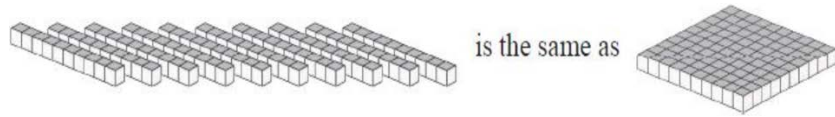


Understand place value (Standards 2.NBT.1–4)	
<p>Standard 2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; <i>for example, 706 equals 7 hundreds, 0 tens, and 6 ones.</i> Understand the following as special cases:</p> <p>a. 100 can be thought of as a bundle of ten tens called a "hundred." b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).</p>	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Understand that one hundred can be represented as 100 single units • Understand that ten sets of ten can be bundled together to make 100 • Understand that when numbers are bundled into sets of hundreds, there are zero tens and zero ones • Identify multiples of a hundred (in the range 100-900) as groups of hundreds with no tens or ones leftover • Understand that in place value a specific digit represents how many hundreds, tens, or ones compose the number • Use place value language to describe amounts of hundreds, tens, and ones. For example, 642 is six hundreds, four tens, and two ones • Identify the value of a given digit in a three-digit number (for example, find the value of the 7 in 706; where 7 represents 700) <p>Teacher Note: Students in second grade extend their understanding of the base-ten system from tens to hundreds as they view 10 tens as a unit called a "hundred." They use manipulatives and pictorial representations to make a connection between the written 3-digit numbers and "hundreds," "tens," and "ones."</p>	
Related Standards: Current Grade Level	Related Standards: Future Grade Levels
<p>2.NBT.2 Count within 1,000; skip-count by 5's 10's and 100's. 2.NBT.3 Read and write numbers to 1,000 2.NBT.4 Compare two three-digit numbers based on meanings of hundreds, tens, and ones digits 2.NBT.6 Add up to four two-digits using strategies based on place value 2.NBT.5, 2.NBT.7 Add and subtract within 100 and 1,000 using strategies based on place value 2.NBT.8 Mentally 10 or 100 to a given number (100 - 900) and mentally subtract 10 or 100 from a given number (100 - 900) 2.NBT.9 Explain why addition and subtraction strategies work, using place value</p>	<p>3.NBT.1 Use place value to round whole numbers to the nearest 10 or 100 3.NBT.2 Fluently add and subtract within 1,000 using strategies and algorithms based on place value 3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range of 10 - 90 using strategies based on place value 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</p>
Critical Background Knowledge from Previous Grade Levels	
<ul style="list-style-type: none"> • Understand that the two digits of a two-digit number represent amounts of tens and ones (1.NBT.2) • Compose and decompose numbers from 11–19 into ten ones and some further ones (K.NBT.1) 	
Academic Vocabulary	
ones, tens, hundreds, decompose, compose, grouping, bundle, place value, digit, value	

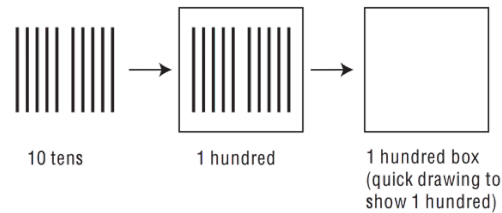
Suggested Models

Base Ten Blocks

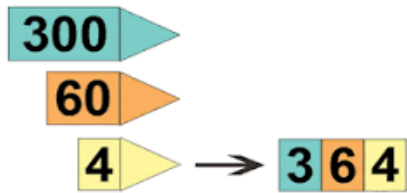


Box, Line, Dot Drawing of Base Ten Blocks

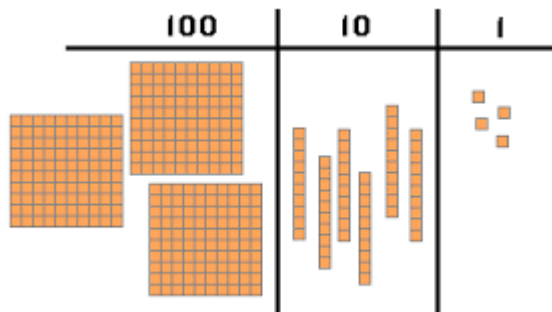
(box=100, line=10, dot=1)



Layered 3-digit Place Value Cards



Place Value Mat





Suggested Strategies

- Use base-ten blocks to represent three-digit numbers
- Place concrete representations on a place value mat to reinforce that multiples of one hundred are made of hundreds with no tens and no ones
- Use place value mats and drawings to represent a number from 100 - 999
- Use place value cards to help students identify the value of the number in the hundreds, tens, and ones places
- Model the same three-digit number (up to 999) using manipulatives and pictorial representations
- Connect physical and pictorial representations with written numerals for multiples of 100. Discuss why the digit zero must be in the tens place and the ones place
- Orally describe a number in terms of place value
- Use hundreds charts and number lines to represent numbers

Image Sources: http://commoncoretools.me/wp-content/uploads/2015/03/ccss_progression_nbp_k5_2015_03_16.pdf;
<http://www.dpi.state.nc.us/docs/curriculum/mathematics/scos/2.pdf>

Understand place value (Standards 2.NBT.1–4)																																																																																																				
Standard 2.NBT.2 Count within 1,000; skip-count by fives, tens, and hundreds.																																																																																																				
Concepts and Skills to Master																																																																																																				
<ul style="list-style-type: none"> Count within 1,000 by ones Count within 1,000 by fives (on the fives, for example 35, 40, 45, 50, . . .) Count within 1,000 by tens (on the decade numbers, for example 90, 100, 110, 120, 130, . . .) Count within 1,000 by hundreds (on the century numbers, for example 200, 300, 400, 500, . . .) Describe number patterns within 1,000 																																																																																																				
Related Standards: Current Grade Level	Related Standards: Future Grade Levels																																																																																																			
<p>2.NBT.1 Understand that the three digits in a three-digit number represent amounts of hundreds, tens, and ones</p> <p>2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction</p> <p>2.NBT.8 Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900</p> <p>2.MD.7 Tell and write time from analog and digital clocks to the nearest five minutes</p> <p>2.MD.8 Solve problems involving money</p>	<p>3.OA.1 Interpret the products of whole numbers, such as interpreting 7×5 as the total number of objects in 7 groups of 5 objects each</p> <p>3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities</p>																																																																																																			
Critical Background Knowledge from Previous Grade Levels																																																																																																				
<ul style="list-style-type: none"> Count to 120, starting at any number less than 120. (1.NBT.1) Relate counting to addition and subtraction (1.OA.5) Count to 100 by ones and tens (K.CC.1) Count forward beginning from any number (K.CC.2) Read and write numerals from 0-20 (K.CC.3) 																																																																																																				
Academic Vocabulary																																																																																																				
pattern, skip count, extend, repeated addition																																																																																																				
Suggested Models	Suggested Strategies																																																																																																			
	<ul style="list-style-type: none"> Use an open number line to illustrate skip counting by fives, tens or hundreds Identify number and counting patterns on a hundreds chart Relate skip counting patterns of 5, 10, and 100 within the range of numbers 1 to 999. For example, skip forward or backward by 5s from 225 to 250 Use repeated subtraction to skip count backwards by 5s, 10s, or 100s 																																																																																																			
<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> <tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr> <tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr> <tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr> <tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr> <tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr> <tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr> </table>		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
1	2	3	4	5	6	7	8	9	10																																																																																											
11	12	13	14	15	16	17	18	19	20																																																																																											
21	22	23	24	25	26	27	28	29	30																																																																																											
31	32	33	34	35	36	37	38	39	40																																																																																											
41	42	43	44	45	46	47	48	49	50																																																																																											
51	52	53	54	55	56	57	58	59	60																																																																																											
61	62	63	64	65	66	67	68	69	70																																																																																											
71	72	73	74	75	76	77	78	79	80																																																																																											
81	82	83	84	85	86	87	88	89	90																																																																																											
91	92	93	94	95	96	97	98	99	100																																																																																											

Understand place value (Standards 2.NBT.1–4)	
Standard 2.NBT.3 Read and write numbers to 1,000 using base-ten numerals, number names, and expanded form.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> Express a given number in multiple ways: <ul style="list-style-type: none"> base-ten numerals (371) base-ten word form (3 hundreds, 7 tens, and 1 one) number names (three hundred seventy-one) expanded form ($300 + 70 + 1$) Compose and decompose numbers by representing numbers using base-ten numerals and expanded form 	
Related Standards: Current Grade Level	Related Standards: Future Grade Levels
<p>2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones</p> <p>2.NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons</p> <p>2.NBT.7 Add and subtract within 1,000 using strategies based on place value</p>	<p>3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100</p> <p>3.NBT.2 Fluently add and subtract within 1,000 using strategies and algorithms based on place value</p> <p>4.NBT.2 Read and write multi-digit whole numbers using base-ten numerals, number names and expanded form</p>
Critical Background Knowledge from Previous Grade Levels	
<ul style="list-style-type: none"> Understand that the two digits of a two-digit number represent amounts of tens and ones (1.NBT.2) Read and write numerals up to 120 (1.NBT.1) Read and write numerals from 0 to 20 (K.CC.3) Compose and decompose numbers from 11-19 into ten ones and some further ones. Record each composition or decomposition by a drawing or equation. ($18 = 10 + 8$) (K.NBT.1) 	
Academic Vocabulary	
hundreds, tens, ones, number names, expanded form, base-ten numerals, base-ten word form	
Suggested Models	Suggested Strategies
	<ul style="list-style-type: none"> Use manipulative materials such layered place value cards and place value dice to make connections between numbers written as base-ten numerals and in expanded form Use base-ten blocks, drawings, and place value mats to represent three-digit whole numbers

Understand place value (Standards 2.NBT.1–4)	
Standard 2.NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Understand that when comparing two numbers, one looks at the whole number, not just individual digits • Understand that a number (greater than 0) in the hundreds place always has a greater value than the number in the tens place • Generalize that the number with the most hundreds is greater • Understand that if the number of hundreds is the same, the number with more tens is greater; if the number of hundreds and tens is the same, the number with more ones is greater • Use terms including greater than, more than, less than, fewer than, equal to, and same as, to describe comparisons • Use the symbols >, =, and < to correctly to compare three-digit numbers • Understand that two three-digit numbers that have equal value are represented by the = sign <p>Teacher Note: In kindergarten students use verbal language to identify whether groups of objects or numerals are greater than, less than or equal to other groups of objects or numerals. In first grade students are introduced to using the symbols to record comparisons. Emphasis should be placed on the meaning of quantities rather than tricks such as “the alligator eats the bigger number,” etc. In second grade, students should become more comfortable with the use and meanings of these symbols.</p>	
Related Standards: Current Grade Level	Related Standards: Future Grade Levels
<p>2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones</p> <p>2.NBT.3 Read and write numbers to 1,000 using base-ten numerals, number names and expanded form</p>	<p>3.NF.3 Compare two fractions with the same numerator or the same denominator. Record the results of comparisons with the symbols >, +, or <</p> <p>4.NBT.2 Compare two multi-digit whole numbers based on meaning of the digits in each place, using >, =, and < symbols</p> <p>4.NF.2 Compare two fractions with different numerators, and different denominators. Record the results of comparisons with symbols >, =, or <</p>
Critical Background Knowledge from Previous Grade Levels	
<ul style="list-style-type: none"> • Understand that the two digits of a two-digit number represent amounts of tens and ones. (1.NBT.2) • Compare two numbers between 1 and 10 presented as written numerals using “great than,” “less than,” or “equal to.” (K.CC.7) • Identify whether the number of objects in one group is greater than, less than or equal to the number of objects in another group. (K.CC.6) • Compose and decompose numbers from 11-19 into ten ones and some further ones (K.NBT.1) 	
Academic Vocabulary	
compare, more, greater than (>), more than, most, less, less than (<), fewer, least, equal (=), same as	
Suggested Models	Suggested Strategies
<p>452 > 438</p>  <p>438 < 452</p> 	<ul style="list-style-type: none"> • Use concrete materials such as objects on a place value chart, a 100 chart, base-ten blocks, and number lines to compare two three-digit numbers • Write two three-digit numbers in expanded form and compare the value of the hundreds, tens, and ones

Use place value understanding and properties of operations to add and subtract (Standards 2.NBT.5–9).	
Standard 2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Extend first grade understanding to add and subtract numbers within 100 • Use concrete representations when adding and subtracting within 100 including composing and decomposing ones, tens, and hundreds • Add and subtract fluently within 100 using strategies based on place value and the relationship between addition and subtraction • Explain why addition and subtraction strategies work when adding and subtracting within 100 • Connect physical representations (objects) to visual representations (drawings) • Connect physical and visual representations to written methods (expressions, equations, expanded form, etc.) and explain the reasoning used • Understand that in adding two-digit numbers, one adds tens to tens and ones to ones • Understand that in adding two-digit numbers, the tens may need to be composed (regrouped) to a hundred ($98+2=100$) • Identify when it is necessary to compose a ten (regroup) and decompose (ungroup) a ten • Write equations for addition and subtraction with sums and differences to 100 	
Teacher Note: The standard algorithm of compose and decompose is neither an expectation nor a focus in second 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 Level
<p>2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems</p> <p>2.OA.2 Fluently add and subtract within 20</p> <p>2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones</p> <p>2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations</p> <p>2.NBT.7 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</p> <p>2.NBT.8 Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900</p> <p>2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations. Explanations may be supported by drawings or objects</p>	<p>3.OA.8 Solve two-step word problems</p> <p>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</p> <p>4.OA.3 Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations</p> <p>4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm</p>
Critical Background Knowledge from Previous Grade Levels	
<ul style="list-style-type: none"> • Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, 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 and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens to tens and ones to ones, and that it is sometimes necessary to compose a ten (1.NBT.4) • Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used (1.NBT.5) • Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (1.NBT.6) • Solve addition and subtraction word problems within 10 (K.OA.2); Make sums of 10 using any number from 1 to 9 (K.OA.4) 	

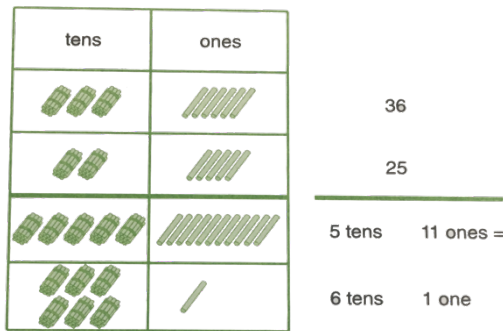
place value, one, tens, add, subtract, compose (regroup), decompose (ungroup), digit(s), total, difference, place value

Suggested Strategies

- Use a hundreds chart, base ten blocks, open number lines, and other manipulatives and models to add and subtract
- Use mental computation and partial sums to develop conceptual understanding and number sense adding and subtracting 2-digit numbers
- Make the next ten to add a two-digit number to a two-digit number (24+18=42 by using 6 ones from the 8 ones and adding it to 24 to make the next ten which is 30. Then add 30 to the remaining 12 ones to get 42.)
- Decompose a ten to subtract a two-digit number from a two-digit number when necessary
- Understand and apply the commutative property, associative property, and the additive identity property of zero (Students may, but need not, use formal terms for these properties)

Suggested Models

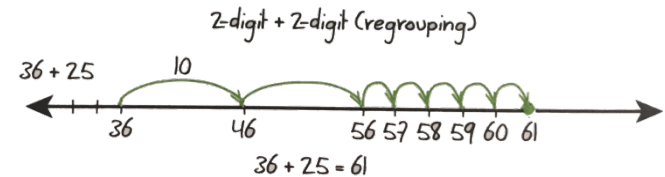
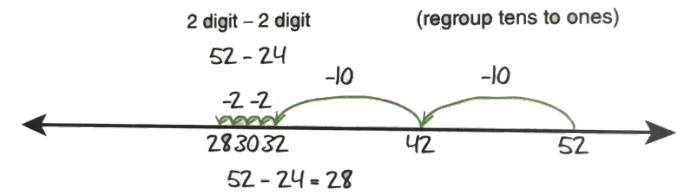
Add two 2-digit numbers, regrouping tens to ones.



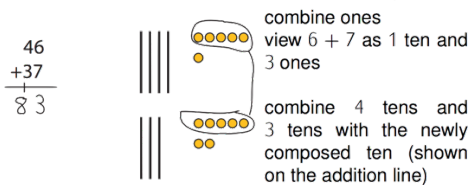
$$\begin{array}{r} 38 \\ + 24 \\ \hline 62 \end{array}$$

$$\begin{array}{r} 38 \quad 30 + 8 \\ + 24 \quad 20 + 4 \\ \hline 50 + 12 = 62 \end{array}$$

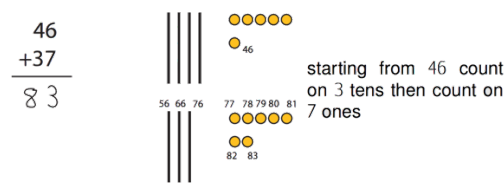
$$\begin{array}{r} 38 \\ + 24 \\ \hline 50 \\ + 12 \\ \hline 62 \end{array}$$



Adding tens and ones separately



Counting on by tens



This method is an application of the commutative and associative properties. The diagrams can help children with understanding and explaining the steps (MP.1). Advantages of writing the 1 below the addends are discussed in the Grade 2 margin.

Counting on by tens from 46, beginning 56, 66, 76, then counting on by ones. This method can be generalized, but the complexity of the counting on required and the lack of efficiency becomes apparent as the number of digits in the addends increases.

Images Sources : http://commoncoretools.me/wp-content/uploads/2015/03/ccss_progression_nbp_k5_2015_03_16.pdf

The Common Core Mathematics Companion: The Standards Decoded, Grades K-2, pp. 106 - 107

Use place value understanding and properties of operations to add and subtract (Standards 2.NBT.5–9).	
Standard 2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Use place value understanding to compute sums of four two-digit numbers using concrete objects, place value cards, or drawings • Use concrete representations to compose (regroup) a new ten or hundred when necessary • Apply various strategies based on number sense and mental mathematics with sums of four two-digit numbers • Explain why addition strategies work when adding four two-digit numbers • Connect physical representations (objects) to visual representations (drawings) • Connect physical and visual representations to written methods (expressions, equations, expanded form, etc.) and explain the reasoning used • Understand that in adding two-digit numbers, one adds tens to tens and ones to ones • Understand that in adding two-digit numbers, the tens may need to be composed (regrouped) to a hundred • Identify when it is necessary to compose a ten (regroup) • Write equations for addition with sums of four two-digit numbers <p>Teacher Note: The standard algorithm of compose and decompose is neither an expectation nor a focus in second 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 1,000. Students are expected to fluently add and subtract multi-digit whole numbers using the standard algorithm by the end of fourth grade. Students may, but need not, use formal terms for properties.</p>	
Related Standards: Current Grade Level	Related Standards: Future Grade Levels
<p>2.OA.2 Fluently add and subtract within 20</p> <p>2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction</p> <p>2.NBT.7 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</p> <p>2.NBT.8 Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900</p> <p>2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations. Explanations may be supported by drawings or objects</p>	<p>3.OA.8 Solve two-step word problems</p> <p>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</p> <p>4.OA.3 Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted</p> <p>4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm</p>
Critical Background Knowledge from Previous Grade Levels	
<ul style="list-style-type: none"> • Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; (1.NBT.4) • Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used (1.NBT.5) • Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20 (1.OA.2) • Add and subtract within 20 (1.OA.6) • Solve addition and subtraction word problems within 10 (K.OA.2) • Make sums of 10 using any number from 1 to 9 (K.OA.4) 	

Academic Vocabulary

compose (regroup), add, total, digit(s), ones, tens, hundreds, place value, addend

Suggested Models

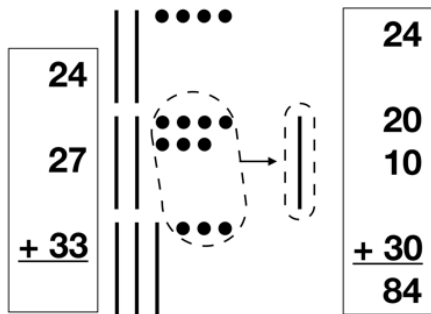
Example: $24 + 27 + 33$

Associative Property:

- Add $27 + 33$ to get 60,
- Then add $24 + 60$ to get a total sum of 84

Place Value:

- Add the tens $20 + 20 + 30 = 70$
- Add the ones $4 + 7 + 3 = 14$
- Add the two sums $70 + 14 = 84$



Suggested Strategies

- Use base ten blocks to add four two digit numbers
- Use the Associative Property to add four two digit numbers
- Use place value charts to add four two digit numbers
- Use hundreds chart to add four two digit numbers
- Use an open number line to add four two-digit numbers
- Use physical models to add and subtract
- Use mental computation to develop conceptual understanding and number sense adding four two digit numbers
- Make the next ten to add a two-digit number to a two-digit number ($24+18=42$ by using 6 ones from the 8 ones and adding it to 24 to make the next ten which is 30. Then add 30 to the remaining 12 ones to get 42.)

Use place value understanding and properties of operations to add and subtract (Standards 2.NBT.5–9).

Standard 2.NBT.7 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.

Concepts and Skills to Master

- Extend understanding from adding and subtracting within 100 to add and subtract within 1,000
- Use concrete representations when adding and subtracting within 1,000 including composing and decomposing ones, tens, and hundreds to regroup when necessary
- Add and subtract within 1,000 using strategies based on place value, number sense, mental mathematics, and the relationship between addition and subtraction
- Explain why addition and subtraction strategies work when adding and subtracting within 1,000
- Connect physical representations (objects) to visual representations (drawings)
- Connect physical and visual representations to written methods (expressions, equations, expanded form, etc.) and explain the reasoning used
- Understand that in adding and subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, and ones and ones
- Understand that in adding three-digit numbers, the hundreds may need to be composed (regrouped) to a thousand ($998+2=1000$)
- Identify when it is necessary to compose (regroup) or decompose (ungroup) a ten or hundred
- 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

Teacher Note: The standard algorithm of compose and decompose is neither an expectation nor a focus in second 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

- 2.OA.1** Use addition and subtraction within 100 to solve one- and two-step word problems
- 2.OA.2** Fluently add and subtract within 20
- 2.NBT.1** Understand the digits of a three-digit number represent amounts of hundreds, tens, and ones
- 2.NBT.5** 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.6** Add up to four two-digit numbers using strategies based on place value and properties of operations
- 2.NBT.8** 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.9** Explain why addition and subtraction strategies work, using place value and the properties of operations. Explanations may be supported by drawings or objects

Related Standards: Future Grade Levels

- 3.OA.8** Solve two-step word problems
- 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
- 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
- 4.NBT.4** Fluently add and subtract multi-digit whole numbers using the standard algorithm

- Related Standards: Current Grade Level (see above)
- Understand that the two digits of a two-digit number represent amounts of tens and ones (1.NBT.2)
- Add and subtract within 100 in specific situations (1.NBT.4, 1.NBT.5, 1.NBT.6)

Academic Vocabulary

place value, one, ten, hundred, add, subtract, compose (regroup), decompose (unregroup), digit(s), total, difference,

Suggested Strategies

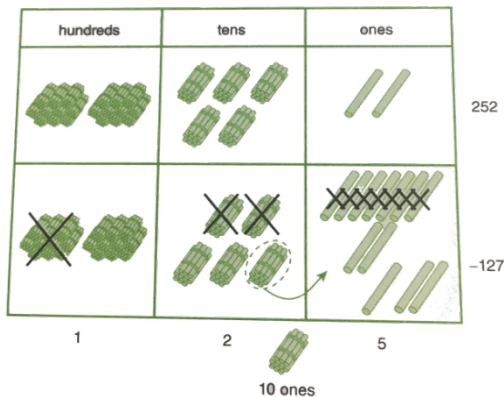
- Use hundreds charts, base ten blocks, open number lines, and place value charts to add and subtract
- Use mental computation to develop conceptual understanding and number sense adding and subtracting two and three digit numbers
- Make the next hundred to add a three-digit number to a two- or three-digit number
- Decompose a ten to subtract a two or one-digit number from a two-digit number when necessary
- Decompose a hundred to subtract a two- or three-digit number from three-digit number when necessary

Suggested Models

Addition: Recording newly composed units in separate rows

$\begin{array}{r} 278 \\ +147 \\ \hline \end{array}$	$\begin{array}{r} 278 \\ +147 \\ \hline 300 \end{array}$	$\begin{array}{r} 278 \\ +147 \\ \hline 300 \\ 110 \end{array}$	$\begin{array}{r} 278 \\ +147 \\ \hline 300 \\ 110 \\ 15 \\ \hline 425 \end{array}$
--	--	---	---

The computation shown proceeds from left to right, but could have gone from right to left. Working from left to right has two advantages: Many students prefer it because they read from left to right; working first with the largest units yields a closer approximation earlier.



$$\begin{array}{r} 200 (-1) = 199 \\ - 46 (-1) = -45 \\ \hline 154 \end{array}$$

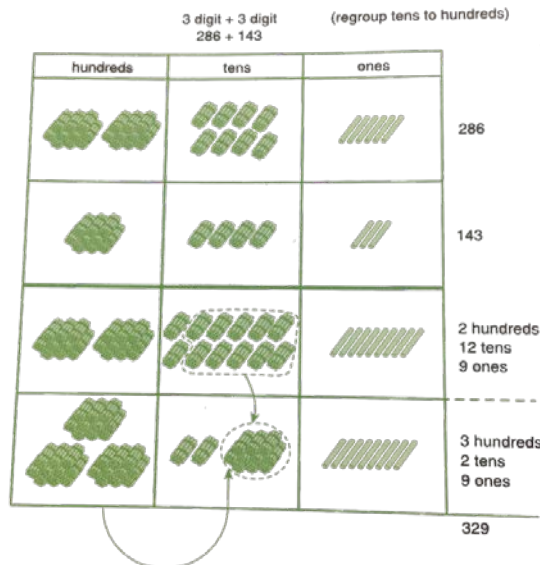
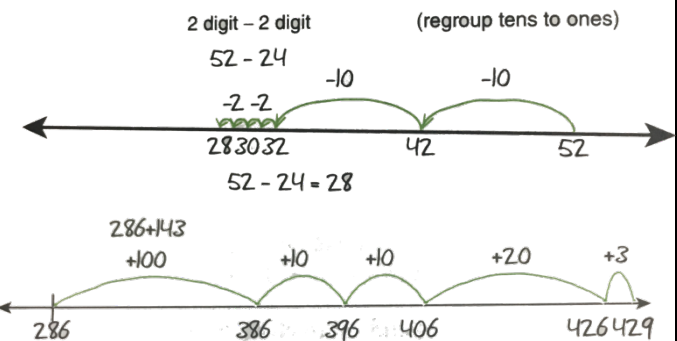
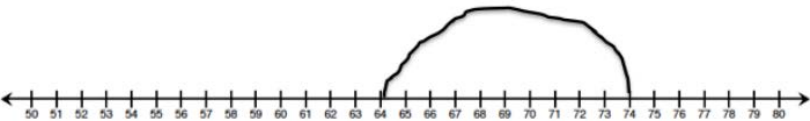
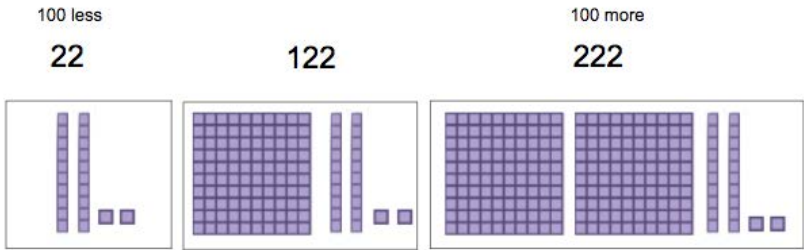


Image Sources: http://commoncoretools.me/wp-content/uploads/2015/03/ccss_progression_nbp_k5_2015_03_16.pdf

The Common Core Mathematics Companion: The Standards Decoded, Grades K-2, pp. 109-110

Use place value understanding and properties of operations to add and subtract (Standards 2.NBT.5–9).	
Standard 2.NBT.8 Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Use mental calculation in finding 10 or 100 more than a given number • Use mental calculation in finding 10 or 100 less than a given number • Explain the reasoning used in finding 10 or 100 more and 10 or 100 less • Understand that only the tens place changes when mentally finding 10 more and 10 less • Understand that only the hundreds place changes when mentally finding 100 more and 100 less 	
Related Standards: Current Grade Level	Related Standards: Future Grade Levels
<p>2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems</p> <p>2.OA.2 Fluently add and subtract within 20</p> <p>2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones</p> <p>2.NBT.5 Fluently add and subtract within 100</p> <p>2.NBT.7 Add and subtract within 1,000</p>	<p>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</p> <p>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</p> <p>4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm</p>
Critical Background Knowledge from Previous Grade Levels	
<ul style="list-style-type: none"> • Relate counting to addition and subtraction (1.OA.5) • Given a two-digit number, mentally find 10 more or 10 less than the number without having to count (1.NBT.5) • Solve addition and subtraction word problems within 10 (K.OA.2) 	
Academic Vocabulary	
more, less, add, subtract, ten, hundred, digit(s)	
Suggested Models	
<p>There were 174 birds in a park and 10 flew away. How many birds remained?</p> <p>I thought about a number line. I started at 174. Then, because 10 birds flew away, I took a leap of 10. I landed on 164. So, there are 164 birds left in the park.</p>  <p>I know that 10 less than 74 is 64. So there are 164 birds left in the park.</p>	
	
Suggested Strategies	
<ul style="list-style-type: none"> • Mentally picture a number line or hundred chart • Mentally picture ten frames • Mentally add or subtract 10 and 100 without having to count by ones • Use drawings and layered cards to explain mental computations 	
Image Source: http://www.dpi.state.nc.us/docs/curriculum/mathematics/scos/2.pdf	

Use place value understanding and properties of operations to add and subtract (Standards 2.NBT.5–9).	
Standard 2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations. Explanations may be supported by drawings or objects.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Understand and explain when to use the Commutative Property and the Associative Property • Explain thinking when solving and addition and subtraction problems • Connect a given addition problem to a related subtraction problem • Connect a given subtraction problem to a related addition problem • Connect models to the related addition and subtraction problems <p>Teacher Note: This standard is connected to and taught along with 2.NBT.5–8. Students may, but need not, use the formal terms for properties. The standard algorithm of compose and decompose is neither an expectation nor a focus in second 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 1,000. Students are expected to fluently add and subtract multi-digit whole numbers using the standard algorithm by the end of fourth grade.</p>	
Related Standards: Current Grade Level	Related Standards: Future Grade Levels
<p>2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.</p> <p>2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.</p> <p>2.NBT.7 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</p> <p>2.NBT.8 Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900</p>	<p>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</p> <p>4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm</p>
Critical Background Knowledge from Previous Grade Levels	
<ul style="list-style-type: none"> • Apply properties of operations as strategies to add and subtract; If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known (Commutative Property of Addition). To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$ (Associative Property of Addition) (1.OA.3) • Understand subtraction as an unknown-addend problem (1.OA.4) • Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10 (1.NBT.4) • Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used (1.NBT.5) • Solve addition and subtraction word problems within 10 (K.OA.2) • Make sums of 10 using any number from 1 to 9 (K.OA.4) 	

Academic Vocabulary

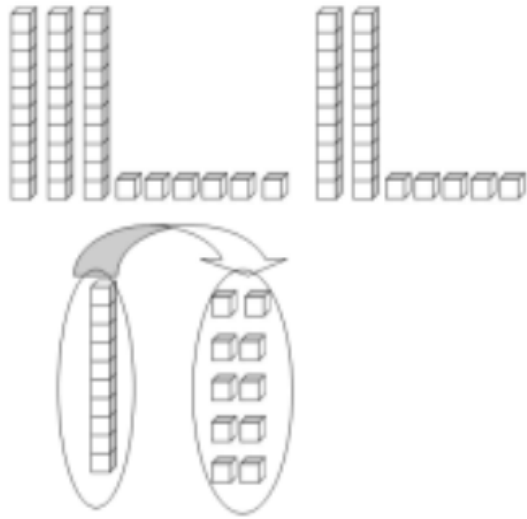
place value, properties of operations, addition, subtraction, compose (regroup), decompose (ungroup), strategy, justify, clarify, reasoning, explain

Suggested Models

Example: There are 36 birds in the park. 25 more birds arrive. How many birds are there? Solve the problem and show your work.

Student A: I broke 36 and 25 into tens and ones $30 + 6 + 20 + 5$. I can change the order of my numbers, since it doesn't change any amounts, so I added $30 + 20$ and got 50. Then I added 5 and 5 to make 10 and added it to the 50. So, 50 and 10 more is 60. I added the one that was left over and got on 6 to get 61. So there are 61 birds in the park.

Student B: I used place value blocks and made a pile of 36 and a pile of 25. Altogether, I had 5 tens and 11 ones. 11 ones is the same as one ten and one left over. So, I really had 6 tens and 1 one. That makes 61.



Suggested Strategies

- Use hundreds chart to add and subtract
- Use base ten blocks to add and subtract
- Use an open number line to add and subtract
- Use physical models to add and subtract
- Use place value charts to add and subtract
- 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>