

## 16.5 Comparing Numbers

### Objectives

- Compare numbers within 100 by looking at the tens and ones digits.
- Use the symbols  $>$  and  $<$ .

### Notes

In the previous lessons, students learned to compare and order numbers primarily based on their position in a number chart. In this chapter, they will compare numbers by focusing on the tens and ones digits of the numbers they are comparing. The symbols for greater than ( $>$ ) and less than ( $<$ ) are introduced.

Numbers can be compared by comparing the digits in the highest place value first. If they are the same, then compare the digits in the next highest place value, and so on. This process will be extended in later levels to numbers past 100. For numbers within 100, you first compare the tens. If they are the same, then you compare the ones. Students will do this first with base-ten material, and then by simply looking at the numbers. They need to realize that they are comparing tens, not just the first digit in the number. With numbers that have only 1 or 2 digits, this is fairly obvious because they are familiar with a hundred chart and the order of numbers on it, but with numbers with more digits that students will encounter in later grades, it may be less obvious.

Compare 21 and 12. 2 1 1 2 2 tens $>$ 1 ten, So $21 > 12$ .	Compare 32 and 35. 3 2 3 5 3 tens = 3 tens 2 ones $<$ 5 ones So $32 < 35$ .	Compare 25 and 8. 2 5 8 2 tens $>$ 0 tens So $25 > 8$ .
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# 16.5a Compare numbers

## Objectives

- Understand that numbers have order.
- Compare numbers within 100 using a number chart.

## Materials

- Sign with  $>$  on it (can be flipped)
- Sign with  $=$  on it
- Picture of crocodiles with mouths open (optional)
- Large number cards with numbers within 100

## Reinforcement 16.5a



## Common Core State Standard

1.NBT.3

## Mathematical Practices

MP2

MP4

MP7

## Key Terms

- Greater than
- Less than
- Symbol

Discussion	Textbook, p. 93												
<ul style="list-style-type: none"> <li>• Ask students what sign, or <b>symbol</b>, they use to show that two numbers or two expressions are the same. (equal sign)</li> <li>• Tell them that they can also use symbols to show that one number is <b>greater than</b> or <b>less than</b> another.</li> </ul>													
<ul style="list-style-type: none"> <li>• Have students discuss why 21 is greater than 12. (21 has 2 tens, and 12 has only 1 ten.)</li> <li>• Point out the shape of the crocodile's mouth. This can help students remember that the open side of the symbols "<math>&gt;</math>" and "<math>&lt;</math>" is toward the larger number, associating them with the mouth of a greedy crocodile that eats the greater number.</li> <li>• Write <math>21 &gt; 20</math> on the board.</li> <li>• Get students to explain why 90 is less than 99. (It has fewer ones and is 9 less.)</li> </ul>	<p><b>5 Comparing Numbers</b></p> <p>I always take the greater amount.</p> <p>2 tens is greater than 1 ten. 21 is greater than 12. We write: <math>21 &gt; 12</math></p> <table border="1" data-bbox="1258 1053 1339 1106"> <tr><th>Tens</th><th>Ones</th></tr> <tr><td>2</td><td>1</td></tr> <tr><td>1</td><td>2</td></tr> </table> <p>0 ones is less than 9 ones. 90 is less than 99. We write: <math>90 &lt; 99</math></p> <table border="1" data-bbox="1258 1223 1339 1276"> <tr><th>Tens</th><th>Ones</th></tr> <tr><td>9</td><td>0</td></tr> <tr><td>9</td><td>9</td></tr> </table> <p>This sign means <b>greater than</b>. This sign means <b>less than</b>.</p> <p>93</p>	Tens	Ones	2	1	1	2	Tens	Ones	9	0	9	9
Tens	Ones												
2	1												
1	2												
Tens	Ones												
9	0												
9	9												
<ul style="list-style-type: none"> <li>• Write two 2-digit numbers with different tens and same ones digit, one above the other, with the digits aligned.</li> <li>• Have students show both numbers with base-ten material. Ask them to explain which number is greater.</li> <li>• Have students write the numbers next to each other and insert the symbol "<math>&gt;</math>" and "<math>&lt;</math>".</li> <li>• Repeat the above with two numbers with the same tens digit but different ones digits.</li> <li>• Guide students to understand the following ideas: <i>You first compare the tens. If the tens are the same, you then compare the ones to see which number is greater.</i></li> <li>• Repeat with a 1-digit number and a 2-digit number. The first digit of the 1-digit number is greater, but it is ones. For example, 9 has no tens. 12 is greater because it has more tens.</li> </ul>	<p>42 62 <math>42 &lt; 62</math> <math>62 &gt; 42</math></p> <p>56 53 <math>56 &gt; 53</math> <math>53 &lt; 56</math></p> <p>9 12 <math>9 &lt; 12</math> <math>12 &gt; 9</math></p>												

- Have three students come to the front of the room. Give two of them number cards and the third a symbol. The third student should stand between the other two and show the symbol pointing in the correct direction. Repeat as time permits.
- Write some numbers next to each other and have students write the symbols for "greater than," "less than," or "equal to" between them. Include some numbers that are equal.

$$32 < 59$$

$$60 > 38$$

$$46 < 48$$

$$82 = 82$$

$$9 < 17$$

$$100 > 10$$

- In pairs, give students four cards with different numbers within 100 on them and ask them to put them in order. They should not use the hundred chart. Alternately, write the numbers on the board.
- Have students explain to their partners how they found the order based on tens and ones.

### Assessment

#### Answers:

- (a)  $43 > 34$   
 (b)  $69 < 78$   
 (c)  $35 > 32$  (d)  $29 < 37$   
 (e)  $47 < 50$  (e)  $50 > 49$
- (a) 39  
 (b) 30  
 (c) 56  
 (d) 98
- 50, 59, 90, 95

### Textbook, p. 94

- Which sign should you use,  $>$  or  $<$ ?



43 ● 34



69 ● 78

- (c) 35 ● 32      (d) 29 ● 37  
 (e) 47 ● 50      (f) 50 ● 49

- Which number is smaller, 40 or 39?
  - Which number is greater, 29 or 30?
  - Which number is the smallest, 65, 64, or 56?
  - Which number is the greatest, 89, 90, or 98?

- Arrange the numbers in order. Begin with the smallest.

**EXERCISE 13**

1. Circle the greater number.

(a) 43      50

(b) 59      54

- (c) 28  26      (d)  70   65  
(e) 78  87      (f) 99  100

2. Circle the greatest number.

- (a) 43  45   42      (b) 78  87   85  
(c)  63   60   62      (d) 98   99  100  
(e) 59  70   62      (f)  57   52   54

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Unit 16: Numbers to 120

3. Circle the smaller number.

(a) 23      25

(b) 30      24

- (c) 31  29      (d)  78   87  
(e)  54   57      (f) 89  87  
(g) 63  60      (h)  98   100

4. Circle the smallest number.

- (a) 35  31   32      (b) 54  50   59  
(c)  45   50   47      (d) 59  56   66  
(e)  15   23   26      (f) 38   40  36

Unit 16: Numbers to 120

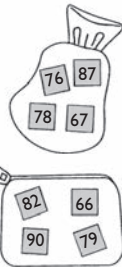
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5. (a) Arrange the numbers in order.  
Begin with the smallest.

—  —  —

(b) Arrange the numbers in order.  
Begin with the greatest.

—  —  —



6. Write > (greater than) or < (less than).

- (a) 44  40  
(b) 50  65  
(c) 62  61  
(d) 70  77  
(e) 39  49  
(f) 58  57  
(g) 73  69  
(h) 65  66  
(i) 24  30  
(j) 47  39

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Unit 16: Numbers to 120

7. Write the numbers in order.  
Begin with the given number.

The smallest number is 12.  
The greatest number is 43.

The smallest number is 29.  
The greatest number is 52.

The smallest number is 68.  
The greatest number is 93.

The smallest number is 58.  
The greatest number is 95.

Unit 16: Numbers to 120

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