ESTAR INTERVENTION

Tier 2 Mathematics Intervention

Module: *Place Value (PV)*

Teacher Lesson Booklet

The Meadows Center for Preventing Educational Risk—Mathematics Institute

The Meadows Center
FOR PREVENTING EDUCATIONAL RISK
THE UNIVERSITY OF TEXAS AT AUSTIN
COLLEGE OF EDUCATION

Mathematics Institute for Learning Disabilities and Difficulties

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25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 1

Build, Write, and Read 3-Digit Numbers

Lesson Objective	• The student will build, write, and read 3-digit numbers with equivalent representations using base-10 materials and expanded notation. • The student will verbally describe 3-digit numbers using base-10 language.	
Vocabulary	**digit:** a numeral from 0 to 9 **base-10 language:** the number broken into groups (for example: instead of "two hundred forty-eight," you would say "2 hundreds, 4 tens, and 8 ones") **equivalent:** equal to, or the same as	
Reviewed Vocabulary	exchange, trade, hundreds, tens, ones	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 1 – 10) • Whiteboard with marker • Base-10 materials: 3 hundreds, 10 tens, 10 ones	• Student Booklet (pp. 1 – 5) • Whiteboard with marker • Base-10 materials: 5 hundreds, 9 tens, 9 ones (per student pair)

Preview

Say: Today we will use base-10 materials to build 3-digit numbers.

Teacher Note
Instruction should focus on using the base-10 language. Manipulatives are used to represent the numbers.

Engage Prior/Informal Knowledge — Time: 3 min

Review the concept of building 2 different base-10 representations of a number with students.

Build 28 in two ways: Build the first representation with 1 ten and 18 ones. Build the second representation with 2 tens and 8 ones. Have students count the two representations. Write the number on the whiteboard.

Ask questions such as:

- Look at the group of 1 ten and 18 ones. How many in all? *(28)* Now look at the 2 tens and 8 ones. How many in all? *(28)*
- How are the two representations different? *(look and listen for answers about the groupings of the number)*
- How are the two representations alike? *(look and listen for answers about counting both representations and writing the number)*

Modeled Practice Time: 8 min

1. Build a 3-digit number in two different ways using base-10 materials.

   Write "345" on the whiteboard. Build 345 using base-10 materials of 3 hundreds, 4 tens, and 5 ones. Provide base-10 materials and a whiteboard to each student.

Say: **This number has 3 *digits*. A *digit* is a numeral from 0 to 9. *Digits* make up numbers the way letters make up words. The first *digit* on the left in 345 is in the hundreds place. What is the *digit* in the hundreds place?** *(3)*

Display a hundred. Have students complete the following as the lesson progresses.

Say: **Each hundred represents, or stands for, 1 group of 100. We could count all the units on this hundred. How many units are on this hundred?** *(100)* **This hundred is also made of 10 tens. Count the 10 groups of ten with me.** *(10, 20 … 100)*

To show 3 groups of 100, with a value of 300, how many hundreds do you think we will need? *(3)* **We need 3 hundreds. Place 3 hundreds on the table and count together.** *(100, 200, 300)*

Point to the tens place in 345.

Say: **The second *digit* is in the tens place. What is the *digit* in the tens place?** *(4)*

How many groups of 10 are in the tens place? *(4)*

Display a ten. Place 4 tens next to the hundreds and have students complete, following your direction.

Say: **Each ten represents, or stands for, 1 group of 10. How many tens will we use to represent, or stand for, 4 groups of 10 in the tens place?** *(4)*

4 tens will be used to show the 4 groups of 10 with a value of 40. Place 4 tens next to the 3 hundreds on the table. Count by tens when counting groups of ten. Count the 4 tens. *(10, 20, 30, 40)*

Point to the ones place in 345.

Say: **The *digit* on the right is in the ones place. What is the *digit* in the ones place?** *(5)*

How many ones are in the ones place? *(5)*

Display a one/unit. Place 5 units next to the tens and have students complete, following your directions.

Say: **Each unit represents one. How many units will we use to represent 5 ones?** *(5)* **Place 5 ones next to the 4 tens. Let's count to check that the number really is 345. Ready, count: 100, 200, 300, 310, 320, 330, 340, 341 … 345.**

What is the total amount? *(345)*

We can describe this number using *base-10 language*, breaking the number into groups. The *base-10 language* for 345 is 3 hundreds, 4 tens, and 5 ones.

Write the *base-10 language* on your whiteboard to describe this number. *(3 hundreds, 4 tens, 5 ones)*

Use 1 of the 3 hundreds and 10 tens to show that 1 hundred is equivalent to 10 tens.

Say: **We want to make 345 a different, or another, way by using more tens.**

1 group of 100 is *equivalent* to 10 groups of 10. *Equivalent* means "equal to or the same as." What does *equivalent* mean? *(equal to or the same as)*

1 hundred is *equivalent* to 10 groups of 10. What else is 1 hundred *equivalent* to? *(allow a variety of answers, such as 100 units, and 5 groups of 10 and 50 ones)*

Exchange the 1 hundred for 10 tens.

Say: **How many hundreds now?** *(2)* **How many tens?** *(14)*

Display 10 units and 1 ten.

Say: **Are 10 ones *equivalent* to a group of 10?** *(yes)*

How do you know? *(allow a variety of answers, such as counting the units on the tens, lining up the units, and so on)*

Count the base-10 materials, pointing at each piece as you count.

Say: **We changed how we made 345. Did we change how many in all?** *(no)* **Count to check how many in all. Ready, count: 100, 200 … 345.**

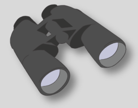
What is the total amount? *(345)*

We changed how we showed 345. What is the *base-10 language* of this representation now? *(2 hundreds, 14 tens, 5 ones)*

These are 2 different ways to represent 345. Are the two forms *equivalent*? *(yes)* **How do you know?** *(they are equal, or the same as)*

Is there another *equivalent* representation to show 345? *(allow students to work to build different representations for 345)*

Watch For



Students may not believe that 1 group of 100 is the same as 10 groups of 10.

For example, students may think that 345 must always be shown as 3 hundreds, 4 tens, and 5 ones.

Model for students the equivalence by lining up 10 tens on top of a hundred.

2. Work with a nonexample of equivalent representation of a number.

Have students grade Juan's work on ***Modeled Practice Sheet #1.***

Say: **Juan drew 647 in two ways using a square for hundreds, a line for tens, and circles for ones. You are the teacher and need to check Juan's work.**

Look at his first drawing of the base-10 materials. How many hundreds did Juan draw? *(6)* **How many tens?** *(4)* **How many ones?** *(7)* **Count the items in his drawing.**

Allow students 5–7 seconds to count the base-10 materials.

Say: **How many in all?** *(647)* **Did he draw the number correctly?** *(yes)*

Look at Juan's second drawing. How many hundreds? *(5)* **How many tens?** *(16)* **How many ones?** *(7)* **Count the items in his drawing.**

Allow students 5–7 seconds to count the base-10 materials.

Say: **Did Juan correctly draw 647 another way?** *(no)*

What is the total for his second drawing? *(667)*

Are the 2 representations Juan built *equivalent*? *(no)*

What did Juan do wrong? *(too many groups of 10)*

Draw another way for Juan to show 647.

Allow students 7–10 seconds to draw the base-10 materials.

Say: **What model could Juan have drawn to show 647?** *(answers will vary; exchange 1 group of 10 for 10 ones, exchange 1 group of 100 for 10 groups of 10, and so on)*

Practice

Time: 8 min

Activity 1: Students will practice building multiple equivalent representations using base-10 materials for 3-digit numbers.

Note to Teacher

Check that students' equivalent representations are correct. Have students count the base-10 materials.

Have students use base-10 materials to build various representations for 291 and 537, recording their combinations on paper or a whiteboard.

Check for understanding of equivalent representations, using the following questions:

- How do you know these representations are equivalent? *(the total number is the same)*
- Why did you choose this representation? *(answers will vary)*
- How many different representations are possible? *(there are many different combinations)*

Have students share one of their representations with the group. Discuss how the representations are not necessarily the same but are all equivalent.

Activity 2: Students will practice equivalent representations.

Have students turn to the ***Practice Sheets*** on pages 2 and 3. Work with students for #1 and #2, confirming that the representations students create are equivalent to one another and represent the number shown. Gradually fade teacher assistance.

Independent Practice — Time: 6 min

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will have 5 minutes to complete the items. Complete as many as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 2

Build, Write, and Read 4-Digit Numbers

Lesson Objective	• The student will build, write, and read 4-digit numbers. • The student will use mathematical language when describing the value of a digit.	
Vocabulary	**standard form:** a number written with 1 digit for each place (example: 2,486) **thousands:** the place-value position that is equal to one thousand times the unit value **period:** a number in standard form separated into groups of 3 digits using a comma	
Reviewed Vocabulary	base-10 language, exchange, trade, hundreds, tens, ones, value, equivalent	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 11 – 20) • Whiteboard with marker • Thousands Place Value Mat • Base-10 materials: 1 thousands (or 10 hundreds combined), 9 hundreds, 9 tens, 9 ones	• Student Booklet (pp. 6 – 10) • Thousands Place Value Mat (1 per student) • Base-10 materials: 1 thousands (or 10 hundreds combined), 9 hundreds, 9 tens, 9 ones (per student pair)

Preview

Say: **Today we will read and write numbers in the thousands.**

Engage Prior/Informal Knowledge — Time: 3 min

Review 3-digit numbers. Give each student a whiteboard.

Dictate the following numbers to students: **831; 507; 7 hundreds, 4 tens, 8 ones; 909; 53; 472; 3 hundreds, 3 tens; 199; 48; and 308**. After dictation, check the number written. Have different students show the group the correct answer.

Say: **I will read you numbers and describe numbers using base-10 language. You need to quickly write the numbers. We will check the numbers and correct any errors.**

Watch For

Students may make common errors when writing numbers. For example, for the number 308, students may write "3008" or "38," or they may transpose numbers.

Have students identify the value of each place and what digit is needed to represent that value. Ask: What is the value of the 3? (300) What digit will you write in the hundreds place for 308? (3)

Model for students and explain that a number in the hundreds has only 3 digits, and that the number means "3 hundreds, 0 tens, and 8 ones." Use base-10 materials or a place-value chart if needed.

Modeled Practice — Time: 8 min

1. Demonstrate working with the next greater place value, the thousands place.

   Using the *Thousands Place Value Mat*, build 999 using the base-10 materials of 9 hundreds, 9 tens, and 9 ones. Provide base-10 materials and a mat for each student to use along with you.

Teacher Note
If there are not enough base-10 materials for each student to build 999 and 1,000, have students work with a partner or in small groups. However, also allow an opportunity for each student in the group to build and trade during the lesson.

Say: **Build 9 hundreds, 9 tens, and 9 ones with your base-10 materials.**

Let's count the base-10 materials to find the total. Ready? Count: 100, 200, 300 … 910, 920, 930 … 991, 992, 993 … 999.

Write "999" on the whiteboard.

Say: **This number is written in *standard form*. The *standard form* of a number is when the number shows only 1 digit for each place.**

How many digits are in each place in standard form? *(1)*

Add 1 unit to the ones place.

Say: **We now have 9 hundreds, 9 tens, and 10 ones. How would we write this number?** *(we can't)*

Correct, we cannot write this number in standard form, because there can only be 1 digit in each place. How many digits in the number 10? *(2)* **The greatest number in each place can only be 9.**

When we have more than 9 ones, we trade or regroup 10 ones for 1 group of 10. 10 ones is equivalent to 1 ten. When we have 10 of any place, we regroup or exchange the 10 for 1 of the next greater place. What should we exchange 10 ones for? *(1 ten)*

Exchange or regroup your 10 ones for a ten.

Why do we exchange or regroup 10 ones for 1 group of 10? *(because we cannot have any more than 9 groups of a unit in any place)*

Next, we need to see how many groups of 10 we have. Count with me: 1 group of 10, 2 groups of 10 … 10 groups of 10.

How many groups of 10 are in the tens place? *(10)*

What should we trade the 10 tens for? *(1 hundred)* **Why?** *(when we have 10 or more, we exchange it for the next greater place)*

Why can't we leave this as 10 groups of 10 when writing standard form? *(because you cannot have more than 9 groups of a unit in any place)*

What is the next greater place after the tens place? *(hundreds place)*

Trade or exchange your 10 tens for a hundred.

We need to see how many groups of 100 we have. Count with me: 1 group of 100, 2 groups of 100 … 10 groups of 100. We have 10 groups of 100, 0 groups of 10, and 0 groups of ones.

Can we write a standard form number for 10 groups of 100? *(no)* **Why not?** *(because you cannot have more than 9 groups of a unit in any place)*

The next greater place is the *thousands* place. What is the next greater place? *(the thousands place)*

We will trade 10 hundreds for a thousand. What should we trade the 10 hundreds for? *(1 thousand)*

Point to each place while telling what the thousands place is equal to.

Say: **The *thousands* place is equal or equivalent to 1,000 ones, or 100 groups of 10, or 10 groups of 100.**

Trade 10 hundreds for 1 thousand and place it in the *thousands* place.

We exchanged, or traded, 10 hundreds for 1 thousand. This cube represents 1,000 ones, or 100 groups of 10, or 10 groups of 100.

How many groups of 100 are equivalent to 1 group of 1,000? *(10)*

How many groups of 10 are equivalent to 1 group of 1,000? *(100)*

How many ones are equivalent to 1 group of 1,000? *(1,000)*

Write "1,000" on the whiteboard and have students read the number. Point to the thousands place in 1,000.

Say: **This number has a comma after the *thousands* place to separate the *thousands period* and the units *period*.**

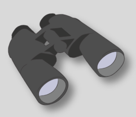
In a *period,* groups of 3 digits are separated with a comma. The units *period* is the ones, tens, and hundreds.

The next *period* is the *thousands period*. This *period* contains thousands, ten thousands, and hundred thousands.

There are 3 places in each *period*: ones, tens, and hundreds. Therefore, how many digits will be in each *period*? *(3)*

The comma separates the *periods* to help us read the number.

Watch For



Students may write the comma in the wrong place. For example, students may write “1,000” as “10,00” or “100,0.” Show and remind students

- **where to write the comma correctly, and**
- **that the comma separates the hundreds place and the thousands place.**

2. Demonstrate the value of the digits in each place using base-10 materials.

   Build 1,235 with base-10 materials. Have students turn to *Modeled Practice Sheet #1*. Complete the steps with students as the lesson progresses.

Say: **The chart shows the place and value for groups of *thousands*, hundreds, tens, and ones.**

Point to each digit in the number 1,235.

Say: **How many digits does the number 1,235 have?** *(4)*

What are the digits in this 4-digit number? *(1,2,3,5)*

When a number has 4 digits, it tells us that the value of the number is in the *thousands*.

We will write the digits in the chart to show the value of each digit. The first digit is a 1. It is in the *thousands*

place. What digit is in the *thousands* place? *(1)* **What is the value of the 1 in this number?** *(1,000)* **Write "1" in the *thousands* place on your chart and the value of 1 below.**

What digit is in the hundreds place? *(2)* **What is the value of the 2 in this number?** *(200)* **Write "2" in the hundreds place on the chart and the value of 2 below.**

What digit is in the tens place? *(3)* **What is the value of the 3 in this number?** *(30)* **Write "3" in the tens place on your chart and the value of 3 below.**

What digit is in the ones place? *(5)* **Write "5" in the ones place on your chart and the value of 5 below.**

Write "1235" at the bottom of the page after Total. Write a comma after the 1 to separate the *thousands period* and the units *period*.

What is the total? *(1,235)*

What is the value of 1 in 1,235? *(1,000)*

3. Demonstrate the value of the digits in each place using base-10 drawings.

   Use *Modeled Practice Sheet #2*.

Say: **We have a number, with pictures to represent the number.**

We will write the digit to show the number of groups for each place. Then we will write the total amount.

Point to the picture of 4 thousands.

Say: **How many groups of 1,000 in the *thousands* place?** *(4 groups of 1,000 in the thousands place)* **Write "4" on the line before the word *thousands*.**

We can say that the digit 4 stands for 4 *thousands* and has a value of 4,000. What is the value of the 4 groups of *thousands*? *(4,000)*

Point to the picture of 3 hundreds.

Say: **How many groups of 100 in the hundreds place?** *(3 groups of 100)* **Write "3" on the line before the word "hundreds."**

We can say that the digit 3 stands for 3 hundreds and has a value of 300. What is the value of 3 groups of hundreds? *(300)*

Point to the picture of 5 tens.

Say: **How many groups of 10 in the tens place?** *(5 groups of 10)* **Write "5" on the line before the word "tens."**

We can say that the digit 5 represents 5 tens and has a value of 50. What is the value of 5 groups of tens? *(50)*

Point to the picture of 6 ones.

Say: **How many ones in the ones place?** *(6 ones in the ones place)* **Write "6" on the line before the word "ones."**

We can say that the digit 6 represents 6 ones and has a value of 6.

What is the total amount? *(4 thousands, 3 hundreds, 5 tens, and 6 ones; or 4,356)* **Write it on the total line**.

Students will draw or cross out pictures of the base-10 materials to identify new totals.

Say: **Draw 2 squares to represent hundreds next to the 3 hundreds that are already there. What is the value of these 2 squares?** *(200)* **What number is 200 more than 4,356?** *(4,556)*

Cross out 3 tens. What is the value of the 3 tens we crossed out? *(30)* **What number is 30 less than 4,556?** *(4,526)*

Draw 4 dots in the ones place. When we add 4 to 4,526, why can't we say "four thousand, five hundred, 20, and 10"? *(because you cannot have more than 9 of any group)* **What number is 4 more than 4,526?** *(4,530)*

Practice — Time: 8 min

Activity 1: Students will practice building, writing, and reading 4-digit numbers using base-10 materials.

Have students use the *Thousands Place Value Mat*. Have students work with partners, sharing one place value mat, a set of base-10 materials, and a whiteboard with marker. Write the following 4-digit numbers on the whiteboard:

- 1,385
- 1,614

Say: **With a partner, make the number with thousands, hundreds, tens and ones materials, then write the number of groups for each place and total on your whiteboard.**

Check for understanding of place value using the following questions:

- How many groups of 1,000, 100, or 10 are in the thousands place, the hundreds place, or the tens place? *(answers will vary by number and place)*
- What is the value of the digit in the thousands place, the hundreds place, the tens place, or the ones place? *(answers should be based on the value of the digit in the place; e.g., 4 groups of 100, 4 hundreds, or 400)*

- How does the comma help in reading the number? *(a comma separates the thousands period and the units period)*

Activity 2: Students will practice reading and writing 4-digit numbers.

Have students turn to the *Practice Sheets* on pages 8 and 9. Work with students on the items, gradually fading your assistance.

Independent Practice   Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and complete as many items as possible. Repeat the number for item #1 two times.

Say: **You will have 5 minutes to complete the items, writing the numbers and the application problem. Complete as many as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 3

Read, Write, and Draw 4-Digit Numbers

Lesson Objective	• The student will build 4-digit numbers in base-10 language using place-value cards. • The student will verbally describe the value of each place, and read and write 4-digit numbers.	
Vocabulary	**No new words are introduced.**	
Reviewed Vocabulary	digit, thousands, period, standard form	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 21 – 34) • Whiteboard with marker • Thousands Place Value Mat • Base-10 materials: 2 thousands, 3 hundreds, 4 tens, and 8 ones • Value Cards with marker	• Student Booklet (pp. 11 – 17) • Whiteboard with marker (1 per student) • Base-10 materials: 2 thousands, 3 hundreds, 4 tens, and 8 ones (per student or student pair) • Value Cards with marker (1 set per student)

Preview

Say: **Today we will read, write, and draw 4-digit numbers.**

Engage Prior/Informal Knowledge — Time: 3 min

Review language from the previous lesson with students.

Write "1,459" on the whiteboard. Build the number with base-10 materials and ask such questions such as:

- Why do we use a comma in this number? *(to separate the thousands period and units period)*
- What does the cube represent? *(1,000)*
- What is equivalent to 1,000? *(1,000 ones; 100 groups of 10; 10 groups of 100)*
- What is the value of the digits in 1,459? *(1,000; 400; 50; 9)*
- If I add 1 more one to this number, what would change? *(10 ones would be traded for 1 ten, the 1 ten would move to the tens place)*

Modeled Practice — Time: 8 min

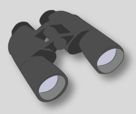
1. Demonstrate the value of digits using base-10 materials and the ***Value Cards***.

   Write "2,348" on the whiteboard. Using the ***Thousands Place Value Mat***, build 2,348 using the base-10 materials of 2 thousands, 3 hundreds, 4 tens, and 8 ones. Provide base-10 materials and mat for each student to use along with you.

Teacher Note
If there are not enough base-10 materials for each student to build the number, have students work with a partner or in small groups. However, also allow an opportunity for each student in the group to build and trade during the lesson.

Say: **What number?** *(two thousand, three hundred forty-eight)*

Watch For



Students may say "and" when saying whole numbers. For example, instead of saying "two thousand, three hundred forty-eight," students might say "two thousand, three hundred <u>and</u> forty-eight."

Demonstrate for students the correct way to say the number. This error should be corrected throughout the lessons.

Say: **How many digits are in 2,348?** *(4)*

Build this number using your base-10 materials and the *Thousands Place Value Mat*.

Wait 10–15 seconds while students build the number using the base-10 materials.

Say: **How many thousands?** *(2)* **How many hundreds?** *(3)* **How many tens?** *(4)* **How many ones?** *(8)*

Use the *Value Cards* to demonstrate. Give each student a set of *Value Cards* and complete the steps with students as the lesson progresses.

Say: **These are Value Cards. We will use these to describe and show the value of each place in the number we just built.**

How many groups of 1,000 are in the number 2,348? *(2)* **What is the value of 2 groups of 1,000?** *(2,000)* **Write "2,000" on the thousands *Value Card*.**

How many groups of 100 in 2,348? *(3)* **What is the value of 3 groups of 100?** *(300)* **Write "300" on the hundreds *Value Card*.**

How many groups of 10 in 2,348? *(4)* **What is the value of 4 groups of 10?** *(40)* **Write "40" on the tens *Value Card*.**

How many ones are in 2,348? *(8)* **What is the value of 8 groups of 1?** *(8)* **Write "8" on the ones *Value Card*.**

We can also use the Value Cards to show the standard form of the number. Overlay each card so that only 1 digit is showing.

Place the hundreds *Value Card* on top of the thousands card. What number? *(2,300)*

Place the tens *Value Card* on top of the hundreds card. What number? *(2,340)*

Place the ones *Value Card* on top of the tens card. What number? (*2,348)*

2. Use base-10 pictures to find the value of each digit, and write the standard form for the number.

   Have students turn to ***Modeled Practice Sheet #1***. Complete the steps with students as the lesson progresses.

Say: **The first set of blocks drawn on the sheet represents thousands cubes. How many thousands does the picture represent?** *(6 thousand)*

Fill in the place-value chart below the picture. What digit will you write in the hundreds place on the chart? *(4)* **Why?** *(because there are 4 hundreds drawn in the picture)*

Allow 5–7 seconds for students to complete the place-value chart.

Say: **Using the picture and the place-value chart, complete the Value Cards to represent the value of each digit.**

What is the value of the 6 in the thousands place? *(6,000)* **Write it in the thousands *Value Card* on your sheet.**

What is the value of the 4 in the hundreds place? *(400)* **Write it.**

What is the value of the tens place? *(80)* **Write it.**

Write the value of the ones. *(3)*

Using all 3 representations of the number, what is the number in standard form, with only 1 digit in each place? *(6,483)*

Subtract 3 groups of a thousand from 6,483. Draw the new number using base-10 pictures.

3. Have students turn to ***Modeled Practice Sheet #2*** to create the greatest and least number from the same set of 4 digits.

Say: **Read the problem together. Ready? Read. "Matt must write the greatest number possible using the digits 8, 4, 9, 2. What is the number Matt will write using only these 4 digits?"**

We will use the place-value charts on the sheet to help write the greatest number.

To find the greatest number possible, we use the largest digit in the greatest place. Which digit is the greatest? *(9)* **What is the greatest place in a 4-digit number?** *(thousands)* **Write "9" in the thousands place.**

What is the value of 9 groups of 1,000? *(9,000)*

What is the next place to the right of the thousands? *(hundreds)* **What digit should we use to make the greatest number?** *(8)* **Why?** *(it is the greatest digit still remaining)* **Write it in the hundreds place.**

What is the next place to the right of the hundreds? *(tens)* **What digit should be placed in the tens?** *(4)* **Why?** *(it is greater than 2)* **Write "4" in the tens place**.

What is the last place? *(ones)* **What digit do we write to finish the number?** *(2)* **Write it in the ones place.**

What is the greatest number Matt can write using the digits 8, 4, 9, and 2? *(9,842)*

Teacher Note

If time allows before the Practice section, have students create the least valued number using these same 4 digits.

Watch For

Students may have problems understanding that a digit in a number represents a value and not a single digit by itself. For example, students may think the 9 in 9,486 represents 9 and not 9,000.

Model for students that the digit represents a value by using base-10 materials and having students count the value for the digit.

Practice

Time: 8 min

Activity 1: Students will practice reading, writing, and drawing 4-digit numbers using base-10 pictures.

Have students turn to the ***Practice Sheet*** on page 13. Have students work with partners. Write "7,492" on the whiteboard.

Have partners draw the number with base-10 pictures, then complete the place-value chart and ***Value Cards***.

Check for understanding of place value using the following questions:

- What would happen to the number if we added 2 groups of 100? *(the number would grow to 7,692)*
- Is 7,692 greater than or less than 7,492? *(greater than)*
- How do you know? *(we added 2 more groups of 100)*
- What is the value of the digit in the thousands place, the hundreds place, the tens place, or the ones place? *(answer should be based on the value of the digit in the place, e.g., 4 groups of 100, 4 hundreds, or 400)*

Have students add another group of 10 to the number. Discuss how and why the number has changed.

Activity 2: Students will practice reading and writing 4-digit numbers.

Have students turn to the ***Practice Sheet*** on page 14.

Dictate the following numbers for students to write in item #3 at the top of the ***Practice Sheet***: 9,824 and 4,825.

Work with students for items #4–6, gradually fading your assistance. Complete both pages.

While working on the practice items, ask questions such as the following:

- What is another name for the groups of 1,000; groups of 100; groups of 10; or ones? *(look for such answers as 4 hundreds or 400)*
- What is the value of the digit in the thousands place, the hundreds place, the tens place, or the ones place? *(answer should be based on the value of the digit in the place, e.g., 4 groups of 100, 4 hundreds, or 400)*
- If I added 4 more groups of 10 to that number, what would change? *(look for answers about the number moving to the next greater place or not)*

Independent Practice **Time: 6 min**

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible. Repeat the numbers for item #1 two times.

Say: **You will have 5 minutes to complete the items, writing the numbers and the application problem. Complete as many as you can. At the end of 5 minutes, we will discuss our answers as a group. For the first item, write these 2 numbers: 6,721 and 4,987.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 4

Expanded Form

Lesson Objectives	• The student will write and read 4-digit numbers in base-10 language, expanded form, and standard form. • The student will verbally describe the value of each place in 4-digit numbers.	
Vocabulary	**expanded form:** a way to write a number that shows the value of each of its digits (example: 2,000 + 400 + 80 + 6)	
Reviewed Vocabulary	digit, thousands, period, equivalent, standard form	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 35-50) • Whiteboard with marker • Value cards with marker (1 set)	• Student Booklet (pp. 18-25) • Whiteboard with marker (1 per student) • Value cards with marker (1 set per student)

Preview

Say: **Numbers can be represented in different ways. Today we will read and write numbers in base-10 language, standard form, and *expanded form*. We will also use Value Cards to show how the standard form relates to the *expanded form*.**

Engage Prior/Informal Knowledge — Time: 3 min

Review with students place-value concepts from the previous lesson.

Have students turn to the ***Engaged Practice Sheet*** and work as a group to answer the questions.

Say: **Read the number at the top of the page.** *(four thousand, eight hundred seventy-five)*

We will work together to answer the questions on the page.

After students have completed the answers, have them read—individually or in unison—the numbers at the bottom of the page.

Modeled Practice — Time: 8 min

1. Demonstrate writing a number in expanded form and standard form.

   Have students turn to ***Modeled Practice Sheet #1***. Point to the base-10 language line. Complete the steps as the lesson progresses.

Say: **This number is written in base-10 language. Let's read the number together. Ready? Read: 6 thousands, 7 hundreds, 8 tens, and 5 ones.**

Complete the ***Value Cards*** showing the value of each digit. Have the students follow along, completing their own ***Value Cards***.

Say: **The Value Cards will show the value of each digit in the number.**

Point to "6 thousands" on the ***Modeled Practice Sheet #1***.

Say: **What place?** *(thousands)* **What value should we write on the thousands *Value Card*?** *(6,000)* **Write it.**

Point to “7 hundreds” on the sheet.

Say: **What place?** *(hundreds)* **What value should we write on the hundreds *Value Card*?** *(700)* **Write it.**

Point to “8 tens” on the sheet.

Say: **What place?** *(tens)* **What value should we write on the tens *Value Card*?** *(80)* **Write it.**

Point to “5 ones” on the sheet.

Say: **What place?** *(ones)* **What value should we write on the ones *Value Card*?** *(5)* **Write it.**

What is the value of each place? *(6,000; 700; 80; 5)*

The Value Cards show the number represented in *expanded form*. *Expanded form* is a way to write a number showing the value of each digit in that number.

What does *expanded form* show us about the number? *(the value of each digit)*

Write “6,000 + 700 + 80 + 5” on the expanded form lines.

Say: **To write in *expanded form,* we write an addition sign between each value. The *expanded form* is 6,000 + 700 + 80 + 5.**

What is the *expanded form* of this number? *(6,000 + 700 + 80 + 5)* **Write it and place an addition sign in each empty circle.**

Overlay the *Value Cards*, placing the greatest number on the bottom, so that the first 1 digit is showing for each place. Have students do the same with their cards.

Say: **The standard form of a number is when the number shows only 1 digit for each place. We can stack the Value Cards to show us**

the standard form, or we can expand the Value Cards to show us the *expanded form* of the number.

Look at the Value Cards. What is the number? *(6,785)*

Is this number in standard form? *(yes)*

How do you know it is the standard form? *(there is 1 digit in each place)*

How many digits are in this number? *(4)*

What is the value of the 7 in 6,785? *(700)*

2. Have students turn to ***Modeled Practice Sheet #2***. Work as a group to identify the error and correct it. Have the students complete the steps on the sheet as the lesson progresses.

Say: **Let's read the problem together. Ready? Read: Pablo played the *Match the Form* game with his friends. He matched the standard form, 5,432, with the *expanded form*, 5,000 + 400 +20 +3. Did he match the correct forms?**

What is the question asking us to find? *(if Pablo correctly matched the forms of the number)*

What can we do to find out if he did or not? *(accept suggestions that include writing out the expanded form or standard form for a number)*

What is the number Pablo has to match with the *expanded form*? *(5,432)* **What is the value in the thousands place?** *(5,000)* **What is the value in the hundreds place?** *(400)* **What is the value in the tens place?** *(30)* **What is the value in the ones place?** *(2)*

Write the *expanded form*. *(5,000 + 400 + 30 + 2)*

Do the forms match? *(no)*

What is the standard form for 5,000 + 400 + 20 + 3? *(5,423)*

3. Work with 6,785 in an equivalent representation.

Use *Modeled Practice Sheet #3*. Complete each section as the lesson progresses.

Say: **This drawing represents base-10 materials. How many in all? Count the picture together. Ready? Count.** *(1,000, 2,000 … 6,785)*

Write the standard form of the number represented by the picture. *(6,785)*

Write the *expanded form* for 6,785. What is the value of the thousands place? *(6,000)* **Write it. What is the value of the hundreds place?** *(700)* **Write it. What do we write between each place in *expanded form*?** *(an addition sign)*

What is the value of the tens place? *(80)* **Write it. What is the value of the ones place?** *(5)* **Write it.**

Read the *expanded form* for 6,785. *(6000+700+80+5)*

We want to keep the amount the same, but draw a different picture that is equivalent to 6,785. Let's trade or regroup 1 thousand for hundreds. How many hundreds are equivalent to 1 thousand? *(10)*

Draw 6,785 using 1 less thousand and 10 more hundreds on your sheet below the words "Another Way."

Describe your drawing using base-10 language. How many thousands? *(5 thousands)* **How many hundreds?** *(17 hundreds)* **How many tens?** *(8 tens)* **How many ones?** *(5 ones)*

Another way to represent 6,785 is with 5 groups of 1,000; 17 groups of 100; 8 groups of 10; and 5 ones.

How do I know this represents the same number? *(1 group of 1,000 is the same as 10 groups of 100)*

Does this drawing still represent 6,785? *(yes)*

We will need to count to make sure. Place your finger on the base-10 picture as we count. Ready? Count. 1,000, 2,000, 3,000 … 5,100, 5,200, 5,300 … 5,900. What is the next hundred? 6,000 … 6,700, 6,710, 6,720, 6,730 … 6,780 … 6,785. What is the standard form of this number? *(6,785)* **Write it.**

Practice — Time: 8 min

Activity 1: Students will each draw the base-10 representation. Then as a group, the students will count the representation to check that it equals 6,785.

Have students work in pairs or small groups to find one other way to draw an equivalent representation of 6,785.

Say: **With your math partner, come up with one other way to represent 6,785. Draw base-10 materials to show us your new form.**

Activity 2: Students will practice working with 4-digit numbers using base-10 language, ***expanded form***, and standard form.

Have student ***Value Cards*** available for student use during the practice.

Have students turn to the ***Practice Sheets*** on pages 22 and 23. Work with students for items #1–3.

For item #3, have students write the standard form and the ***expanded form*** for 9,826. After completing item #3, ask the following question:

Say: **If I added 4 ones, how would the number change?** (*the 6 would increase by 4 ones to be 10, the number would move to the next greater place)*

Check for understanding of place value using the following questions:

- How do you know the value for the digit in the ______ place? (*answers should use language of what the digit in that place represents; for example, an answer may be, "the digit is in the hundreds place, so the 3 represents 3 hundreds")*

- What place stands for the groups of ______ in the number? *(answers should use the language of the groups representing a place in the number)*
- How can you use the ***Value Cards*** to show that you are correct? *(I can write the values on the cards to see the number expanded; I can collapse the cards to see the standard form)*

Gradually fade teacher assistance. Have students complete both pages.

Independent Practice Time: 6 min

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible. Repeat the number for item #3 two times.

Say: **You will have 5 minutes to complete the items, writing the numbers and the application problem. Complete as many as you can. At the end of 5 minutes, we will discuss our answers as a group. For #3, write the standard form and the *expanded form* for 5,635.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

ESTAR INTERVENTION

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 5

Value of Zero in Numbers

<table>
<tr><td>Lesson Objectives</td><td colspan="2">• The student will read and write 4-digit numbers, including numbers with 0, in various places in base-10 language, expanded form, and standard form.
• The student will verbally describe the value of each place.</td></tr>
<tr><td>Vocabulary</td><td colspan="2">No new vocabulary words are introduced.</td></tr>
<tr><td>Reviewed Vocabulary</td><td colspan="2">expanded form, standard form, digit, thousands, period</td></tr>
<tr><td rowspan="2">Instructional Materials</td><td>Teacher</td><td>Student</td></tr>
<tr><td>• Teacher Masters (pp. 51-64)
• Value cards with marker
• Whiteboard with marker
• Base-10 materials: 2 thousands, 3 hundreds, 4 ones</td><td>• Student Booklet (pp. 26-32)
• Value cards with marker (1 set per student)
• Whiteboard with marker (1 per student)</td></tr>
</table>

Preview

Say: **Today we will read and write numbers with 0 in base-10 language, standard form, and expanded form.**

Engage Prior/Informal Knowledge Time: 3 min

Review with students' language from the previous lesson. Write "3 groups of 1,000, 8 groups of 100, 9 groups of 10, 2 ones" on the whiteboard. Give each student a whiteboard.

Ask some of the following questions:

- What is the standard form of this number? *(3,892)* Write it.
- Write "3,892" on the whiteboard and display *Value Cards* on the table. Ask: What would the expanded form of this number look like with *Value Cards*? *(have students help build the number)*
- What is the expanded form for 3,892? *(3,000 + 800 + 90 +2)* Write it.
- How could we use the *Value Cards* to check our answer? *(expand the cards to show all the parts of the number)*
- What would change if I add 1 more group of 10? *(the 10 groups of 10 would move to the hundreds place, increasing the hundreds place to 9 groups of 100)*

Modeled Practice — Time: 8 min

1. Write numbers with 0, using the *Value Cards*.

   Write "2,304" on a whiteboard. Have students help you build the model for 2,304, using base-10 materials as the lesson progresses. Leave the model on the table for the remainder of the Modeled Practice section.

Say: **What number?** *(2,304)* **We will build it together and use the model to write "2,304" in expanded and standard form.**

How many thousands do we need? *(2)* **How many hundreds?** *(3)* **How many tens?** *(0)* **Why?** *(there are no tens in the number)* **How many ones?** *(4)*

How many in all? *(2,304)*

Have students turn to *Modeled Practice Sheet #1* and complete *Value Cards* as the lesson progresses.

Say: **This number is represented with pictures of base-10 materials.**

What is the value we will write on the thousands *Value Card*? *(2,000)* **Write it.**

What is the value we will write on the hundreds *Value Card*? *(300)* **Write it.**

What is the value we will write on the tens *Value Card*? *(allow students to make predictions)*

When a place does not have any groups, we write the digit 0. What value does 0 have? *(nothing)*

Yes, if I had 0 dollars I would not have any money, but what if I had a check for $30? Does this still mean I have nothing? *(no, you have money)*

A digit 0 is important to show the value of a whole number. It demonstrates that there are 0 groups in that place.

Because there are no groups of 10, what number should we write in the tens *Value Card*? *(0)* **Write it.**

What is the value we will write on the ones *Value Card*? *(4)*

Why do we have to write a 0 in the tens place on the *Value Card*? *(it shows that there are 0 groups of 10)*

What value does the 0 represent? *(0, or 0 groups of 10)*

Overlay your cards to show 1 digit for each place. By showing only 1 digit for each place, we have the standard form for the number. What is the standard form for the number? *(2,304)*

Write "2,304" on the standard form line as I do the same.

Listen to the number: 2,304. How many digits do you hear? *(3 digits)*

When you hear, read, or write a number, think about what each digit means.

Point to each place on the *Value Cards*.

Say: **In the number 2,304, I hear 2 thousands in the thousands place, 3 hundreds in the hundreds place, and 4 ones in the ones place. I do not hear any tens in the tens place.**

What is in the tens place? *(0)*

Why is 0 in the tens place? *(the tens place does not have any groups, and the 0 holds the tens place)*

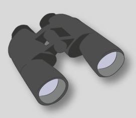
If 0 were not representing the tens place, what would the number be? *(234)*

Write "234" and "2,304" on the whiteboard.

Say: **Does 234 have the same value as 2,304?** *(no)*

How are 234 and 2,304 different? *(234 has 3 digits and 2,304 has 4 digits; 234 does not have any value in the thousands place and 2,304 has 2 groups of 1,000; 2,304 has thousands and 234 does not)*

Watch For



Students may not understand that 0 is necessary to hold a place.

For example, a student may not see the difference between a number with and without the 0 (2,304 and 234).

Model the number using base-10 materials. Have students count the blocks with you. When writing the digits in the place-value cards, emphasize that the place with a 0 in it does not have any groups to count.

2. Write numbers with 0 in expanded form.

Complete the steps along with the students using the *Modeled Practice Sheet #1.*

Say: **Look at your Value Cards.**

We will write this number in expanded form. How do the Value Cards help with the expanded form? *(each card shows a value for the thousands, hundreds, tens, or ones place)*

Spread your Value Cards back out so that each value can be seen.

What is the value in the thousands place? *(2,000)* **Write it.**

Write "2,000 +" in the blank for the expanded form.

Say: **What is the value in the hundreds place?** *(300)* **Write it.**

Write "300 +" in the blank for the expanded form.

What is the value in the tens place? *(0)*

Since there are no groups of 10, we do not write a value for the tens place in the expanded form.

What is the value in the ones place? *(4)* **Write it.**

Write "4" in the blank for the expanded form.

Say: **What is the expanded form for this number?** *(2,000 + 300 + 4)*

What is the value of the tens place? *(0)*

Why is the tens place not represented in the expanded form? *(there are no groups of 10 in this number)*

3. Read and write a number with a 0 in standard and expanded forms.

Have students turn to *Modeled Practice Sheet #2*. Complete the steps along with the students.

Say: **What is the place of the underlined number?** *(hundreds)*

What is the value of the underlined number? *(0)*

Fill in the Value Cards on the practice sheet.

Fill in the *Value Cards* on the sheet with "3,000 + 000 + 50 + 8." Check that students have filled in the cards correctly.

When the number is written in expanded form, which place will not be written? *(hundreds)*

What is the expanded form for 3,058? *(3,000 + 50 + 8)* **Write it.**

Write "3,000 + 50 + 8"on the expanded form line.

Say: **How would the expanded form change if I add 2 groups of 100 to this number?** *(it would change the expanded form from 3 values to 4 values)*

What would the new expanded form be? *(3000 + 200 + 50 + 8)*

Write "3,000 + 200 + 50 + 8" on the second expanded form line.

Say: **Do we still need a 0 in the hundreds place?** *(no, the hundreds place now has a value of 200)*

What is the new number in standard form? *(3,258)* **Write it.**

Write "3,258" on the standard form line.

Why is 0 not in the hundreds place anymore? *(the hundreds place now has a value of 200 instead of 0)*

4. Demonstrate a mistake made with writing a number with a 0.

Have students turn to *Modeled Practice Sheet #3*. Complete the steps along with the student.

Say: **Let's read the problem together. Ready? Read: To make a necklace, Marcy's grandmother told her to buy 1,036 beads. On her shopping list, Marcy writes down "136 beads." Will Marcy have enough beads for her necklace?**

What are the 2 numbers in this problem? *(1,036 and 136)* **Write it.**

What is the question asking? *(if Marcy will buy enough beads)*

Will Marcy buy the right amount if she buys what she wrote down? *(no)*

How do you know? *(she needs a little more than 1,000 beads and she plans to buy a little more than 100 beads)* **Write it.**

Have students write a sentence or two to explain why Marcy will not have enough beads.

How many digits should she write for the number 1,036? *(4 digits)*

What did she leave out of her number? *(0 for the hundreds)*

Why is the 0 needed in the number 1,036? *(to represent that no groups of 100 are in the number 1,036; so Marcy will buy the right amount of beads)*

Practice — Time: 8 min

Activity 1: Students will practice working with 4-digit numbers using base-10 language, expanded form, and standard form.

Have *Value Cards* available for student use during the practice.

Have students turn to the *Practice Sheets* on pages 29 and 30. Students will work to complete both pages with a math partner. When finished, have students share their work with the group.

After item #1, have students add 5 groups of 10 to the number.

Say: **How did the number change?** *(the number doesn't have 0 as a placeholder for the tens place)*

Why is 0 not in the tens place anymore? *(the 5 groups of 10 changed the value of the 0 in the tens place)*

For item #2, have students write the standard form and the expanded form for 2,095 and 9,107.

Work with students for items #3–5, gradually fading your assistance. Complete both pages of the *Practice Sheet*. Check for understanding of place value using the following questions:

- Why is a 0 in the hundreds [tens or ones] place? *(0 groups or a 0 value in the place)*
- If 0 were not holding the place, what would happen to the number? *(it would be a 3-digit number instead of a 4-digit number; the value for that place would not be represented)*

Activity 2: Students will practice concepts while playing the *Zeros in the Form!* game.

Have students work with partners on whiteboards or paper, as well as student *Value Cards*. Give each pair a 4-digit number with a 0 in the number. Have one student write the number on the *Value Cards* and the other student write the expanded form on his or her whiteboard. Then, have partners check the different representations. Repeat 1–2 times.

During the game, ask such questions as:

- What is another name for the groups of 1,000, groups of 100, group of 10, or ones? *(look for such answers as 4 hundreds or 400)*
- How do you know when to write 0 in the hundreds place, tens place, or ones place? *(look for answers relating the value to the place and holding the place)*
- If I added 2 more groups of 100 to that number, what would change? *(accept answers that reflect the change in the hundreds place)*

Independent Practice — Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and complete as many items as possible. Repeat the numbers for items #1 and #2 two times each.

Say: **You will have 5 minutes to complete the problems. Complete as many as you can. At the end of 5 minutes, we will discuss our answers as a group. For the first item, write these 2 numbers in standard form and expanded form: 6,053 and 7,809.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

ESTAR INTERVENTION

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 6

Word Form

Lesson Objectives	• The student will read and write 4-digit numbers in word form, expanded form, and standard form. • The student will verbally describe the value of each place and apply the value to the word form.	
Vocabulary	**word form:** the standard form of number written in words	
Reviewed Vocabulary	expanded form, standard form, digit, base-10 language	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 65-78) • Whiteboard with marker • Number Word Bank sheet • Number cube	• Student Booklet (pp. 33-39) • Whiteboard with marker (1 per student) • Number Word Bank sheet (1 per student)

Preview

Say: **Numbers can be represented in different ways. We have learned how to read and write numbers in base-10 language, expanded form, and standard form. Today we will read and write numbers in *word form*.**

Engage Prior/Informal Knowledge **Time: 3 min**

Review the concept of 0 in a number with students.

Write "5,032; 1,901; 8,002" on the whiteboard. Then, have students read the numbers out loud and discuss the expanded form for each number.

Read the following numbers to the students: 4,016; 4,092; and 7,105. Have the students write the number in standard form on their whiteboards. Discuss what the 0 represents in each number and how the number would change if the 0 were not there.

Modeled Practice **Time: 8 min**

1. Demonstrate writing the *word form* of a number.

   Write "28" on the whiteboard.

Say: **Today we will write numbers in *word form*. *Word form* is the standard form of a number written in words. Write the *word form* for 28 on your whiteboard. What would be the *word form* for 28?** *(twenty-eight)*

Have students turn to ***Modeled Practice Sheet #1***, and point to the number 8,264. Complete the steps with the students as the lesson progresses.

Say: **Read this number. What number?** *(8,264)*

What place does the comma separate in 8,264? *(the thousands place and the units place)* **We will write "8,264" on the Value Cards.**

What are the values of each digit? *(8,000, 200, 60, 4)*

Write "8,264" in expanded form. *(8,000 + 200 + 60 +4)*

Now, we will use the Value Cards and the expanded form to help write the number in *word form*.

Point to the comma and the 8 in 8,264.

Say: **When reading or writing the *word form* of a 4-digit number, begin with the number to the left of the comma.**

We begin writing this number in *word form* by looking at the thousands place.

What is the value of 8? *(8,000)*

How do you know the value of 8? *(the Value Card and the expanded form show that 8 represents 8,000; the 8 is in the thousands place)*

Write "eight" before "thousand" to represent 8,000 in the *word form*.

What is the next greatest place? *(hundreds)* **What is the value of 2?** *(200)*

How do you know the value of 2? *(the Value Card and the expanded form show that 2 represents 200; the 2 is in the hundreds place)*

Write "two" before "hundred" to represent 200 in *word form*.

What is the next place? *(tens)* **What is the value of 6?** *(60)*

How do you know the value of 6? *(the Value Card and the expanded form show that 6 represents 60; the 6 is in the tens place)*

Write "sixty" in the next space. We do not write "tens" because we do not have 60 tens; we have 6 tens. When a number in *word form* is in the tens place, it will have "-ty" or "-teen" at the end. Ten, eleven, and twelve are the exceptions.

What is the value of 4? *(4)*

How do you know the value of 4? *(the Value Card and the expanded form show that 4 represents 4; the 4 is in the ones place)*

Write "four" in the last space. What place is 4? *(ones)* **We do not have to write the word "ones" in *word form*, just the value.**

We use a hyphen to connect the tens and the ones when the number of tens is greater than 1. If a 1 is in the tens place, then the number is ten, eleven, twelve, or a "-teen."

Is the number of tens more than 1? *(yes)*

Hold up the *Number Word Bank* and point to the words that were written for 8,264.

Say: **There may be number words that are tricky to spell. You can look at the *Number Word Bank* to find the number word you need to spell.**

Watch For

Students may have difficulty writing the *word form* of a 4-digit number, particularly with spelling or writing the correct places.

For example, for 8,264 students may write "eight thousand, six hundred four" instead of "eight thousand, two hundred sixty-four."

Reinforce for students the proper writing of numerals by
•having students find the number words in the Number Word Bank to help with spelling the correct places, and
•pointing to the section of the word form, Value Cards, or expanded form for each place to help with writing the correct places.

Say: **Read the *word form* for this number.** *(eight thousand, two hundred sixty-four)*

2. Demonstrate writing the standard form of a number in *word form*.

Have students turn to ***Modeled Practice Sheet #2,*** and point to "four thousand, six hundred twenty-five." Complete the sheet together as the lesson progresses.

Say: **Four thousand, six hundred twenty-five is written in *word form*. We will write the standard form for the number.**

How many digits will be in this number when written in standard form? *(4)* **How do you know?** *(it is in the thousands place)*

When you read or write the *word form* of a 4-digit number, you begin with the number to the left of the comma. We begin writing this number by looking at the thousands place.

How do I show the value of 4 thousand in standard form? *(4 in the thousands place with a comma)*

Write "4" in front of the comma to represent 4 thousands.

Write "4" on the blank before the comma. Point to "six hundred twenty-five" and slide your finger under the words.

Say: **What words are to the right of the comma?** *(six hundred twenty-five)*

How do I show the value of six hundred in standard form? *(6 in the hundreds place)*

Write "6" after the comma to represent 6 hundreds.

How do I represent the value of twenty-five in standard form? *(2 in the tens place and 5 in the ones place)*

Write "2" to stand for 2 tens and "5" to stand for 5 ones.

Show me your standard form for four thousand, six hundred twenty-five. *(4,625)*

Practice — Time: 8 min

Teacher Note

Students may use the ***Number Word Bank*** for any part of this lesson. Keep the ***Number Word Bank*** for use in future lessons.

Activity 1: Students will practice working with 4-digit numbers using *word form*, expanded form, and standard form.

Have students turn to the ***Practice Sheet*** on page 35. Work with students for items #1–8, gradually fading your assistance. Complete both pages.

Check for understanding of place value using the following questions:

- What is the value of ___ in the thousands place, the hundreds place, the tens place, and the ones place? *(answers should be based on the value of the digit in the place, e.g., 4 groups of 100, 4 hundreds, or 400)*

After #3 and #7:

- If I added 4 ones, how would the number change? *(for item #3, the number would increase by 4 ones to be 2,805; for item #7, the ones place would have a group of 10 and the number will change to 1,921)*
- How do you know? *(for item #3, I add the additional ones to the ones place; for item #7, when I have a group of 10 in a place, it changes to the next greater place)*

Watch For

Students may incorrectly write the digits in standard form.

For example, when trying to write "5,362," a student might instead write "5,30062." Students can be confused between writing 1 digit for the place and the value for the place.

Remind students of the number of digits that are needed for the number.

Activity 2: Students will practice concepts while playing the *Write the Form!* game.

Have students turn to the ***Practice Sheet*** on page 36. Using a number cube, have one student roll to determine the first digit in the number. Every student will write the value of the digit in expanded form, the word for the digit in *word form*, and then the digit itself in standard form. Pass the number cube to the next student to roll for the next digit in the number. Continue until the group has created a 4-digit number. Repeat for a second number.

Independent Practice **Time: 6 min**

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will have 5 minutes to complete the items. Complete as many as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 7

Read and Write 5-Digit Numbers

Lesson Objectives	• The student will read and write 5-digit numbers in base-10 language, expanded form, and standard form. • The student will read and write 5-digit numbers.	
Vocabulary	**ten thousands:** the place-value position that is equal to ten thousand times the unit value.	
Reviewed Vocabulary	digit, expanded form, period, standard form, thousands, word form	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 79-92) • Whiteboard with marker • Value Cards with marker • *Guess My Number* Cards	• Student Booklet (pp. 40-46) • Value Cards with marker (1 set per student) • Whiteboard with marker (1 per student)

Preview

Say: **Today we will read and write 5-digit numbers.**

Engage Prior/Informal Knowledge Time: 3 min

Review the concept of the next greater place value with students.

Write "6,748" on the whiteboard. Draw base-10 pictures if needed to help students visualize the questions.

Say: **How many more groups of 100 are needed in the hundreds to make another thousands group?** *(3 more hundreds)* **How do you know?** *(300 + 700 = 1000 or 3 + 7 = 10)*

When we add 3 more hundreds, we then trade 10 hundreds for what? *(1 group of a thousand)* **What is the new number after 3 hundreds are added to the hundreds place?** *(7,048)*

How many ones would need to be added to the units place to make another group of 10? *(2 more ones)* **How do you know?** *(8 + 2 = 10)*

If 2 more ones were added to 6,748, what would be the new number? *(6,750)*

What would be the new number if 6 tens were added to 6,748? *(6,808)*

What place values changed? *(tens and hundreds)*

Modeled Practice Time: 8 min

1. Demonstrate working with the next greater place value.

   Display 9,678 with the teacher's ***Value Cards***.

Say: **What number do we have?** *(9,678)*

If I add 3 groups of 1,000, how many groups of 1,000 will I have? *(12 groups of 1,000)*

Erase the 9 in the thousands place on the thousands *Value Card* and write "12" in the thousands place.

Say: **Is this the correct way to show this number in standard form?** *(no)*

What is the problem with this standard form? *(we cannot have more than 9 in any place)*

What are we supposed to do when we have more than 9 in any place? *(trade 10 to move to the next greater place)*

Point to the 12 groups in the thousands place.

Say: **How many groups of 1,000 do I have?** *(12)*

I need to take 10 groups of 1,000 and trade for 1 of the next greater place.

Pick up the 10,000 *Value Card*, show it to students, and add it to the back of the value cards. Circle the 10 groups of 1,000 on the thousands *Value Card*.

Say: **The next greater place after the thousands place is the *ten thousands* place. What is the next greater place after the thousands place?** *(the ten thousands place)*

I trade 10 groups of 1,000 for 1 group of 10,000. What is 12 – 2? *(10)* **What is 12 groups of thousands minus 10 groups of thousands?** *(2 thousand)*

Erase the 10 groups of 1,000 (leaving 2 groups of 1,000) and write "1" on the 10,000 *Value Card*. The value cards should show 12,678.

Say: **The new number is twelve thousand, six hundred seventy-eight.**

What is the new number? *(12,678)*

Take the ten thousands *Value Card* out to show students.

Say: **The *ten thousands* place is equal to 10,000 ones or 10 groups of 1,000.**

How many groups of 100 would be equal to 10,000? *(you may need to remind students that 1,000 is equal to 10 groups of 100, so 10,000 would be equal to 100 groups of 100)*

2. Demonstrate periods in the place-value chart and writing a number in each period.

Have students turn to ***Modeled Practice Sheet #1.*** Point to the units period. Teacher and students should complete the sheet as the lesson progresses.

Say: **This place-value chart shows the parts just as the Value Cards do. It is useful in helping us see the periods in a number. What 3 places does the units period contain?** *(ones, tens, and hundreds)*

Write "783" in the units period on the place-value chart on your sheet.

In the units period, how many groups of 100 are there? *(7)* **How many groups of 10?** *(8)* **How many ones?** *(3)*

Point to the thousands period.

Say: **The thousands period contains the thousands, *ten thousands*, and hundred thousands places. What places are in the thousands period?** *(thousands, ten thousands, and hundred thousands)*

Write "52" in the thousands period.

In the thousands period, how many groups of 10,000 are there? *(5)* **How many groups of 1,000?** *(2)*

Point to each place in the number.

Say: **How many digits are in this number?** *(5)*

To read a 5-digit number, we look at the number to the left of the comma first.

Cover the units period with your hand. Slide your finger under 52.

Say: **What number is to the left of the comma?** *(52)*

This is the thousands period, so after 52 we say, "thousand."

Say it with me, "52 thousand."

Use your hand to cover the thousands period.

Say: **The digits to the right of the comma tell us the number in the units period. What is the number in the units period?** *(783)*

While reading the number, first cover the units period, then cover the thousands period. Have students repeat.

Say: **Repeat after me: "fifty-two thousand, seven hundred eighty-three."**

Read the number. *(52,783)*

3. Demonstrate writing a 5-digit number in expanded form.

Point to the expanded form line on *Modeled Practice Display #1*.

Say: **Writing a 5-digit number in expanded form requires the same steps as a 4-digit number, except there is an added value for the *ten thousands* place.**

Point to the ten thousands place.

Say: **The digit 5 in the *ten thousands* place represents 50,000. What is the value of the *ten thousands* place?** *(50,000)*

What is the expanded form of this number? *(50,000 + 2,000 + 700 +80 +3)* **Write it.**

Point to the standard form line on *Modeled Practice Display #1*.

Say: **The standard form of this number is 52,783. What is the standard form of this number?** *(52,783)* **Write it.**

4. Demonstrate writing a 5-digit number in word form.

Point to the word form line on *Modeled Practice Display #1*.

Say: **Writing a 5-digit number in word form requires the same steps as a 4-digit number, except there is one additional place.**

Point to the thousands period, then the units period.

Say: **It is helpful to think of the number as having two parts: the part in the thousands period and the part in the units period.**

Cover the units period in the place-value chart with your hand.

Say: **What number is in the thousands period?** *(52)*

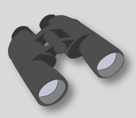
I write "fifty-two" with a hyphen to represent fifty-two thousand.

Use your hand to cover the thousands period in the place-value chart.

Say: **What number is in the units period?** *(783)*

Write "seven hundred eighty-three" to the right of the comma.

Watch For



Students may have difficulty writing the word form of a 5-digit number, such as spelling or writing the correct places.
For example, for 38,264, students may write "thirty-eight thousand, six hundred four" instead of "thirty-eight thousand, two hundred sixty-four."
Reinforce for students the proper writing of numerals by:
- **having students find the number words in the Number Word Bank to help with spelling the correct places, and**
- **pointing to the section of the word form, Value Cards, or expanded form for each place to help with writing the correct places.**

Say: **The word form is fifty-two thousand, seven hundred eighty-three.**

What is the word form? *(fifty-two thousand, seven hundred eighty-three)*

5. Demonstrate writing the standard form of a number in word form.

   Have students turn to ***Modeled Practice Sheet #2***.

Say: **Read the problem together. Ready? Read: "Scientists were studying ant colonies in Texas. In one colony, there were thirty-two thousand, five hundred forty-one ants. What is the number of ants in this colony written in standard form?"**

What form is this number written in? *(word form)*

Read the number. *(Thirty-two thousand, five hundred forty-one)* **Underline it.**

When you read or write the word form of a 5-digit number, where should you begin? *(with the digits to the left of the comma)*

What is the number to the left of the comma? *(32)* **What period is the number in?** *(thousands period)*

How do you show the value of thirty-two thousand in standard form? *(3 in the ten thousands place and 2 in the thousands place with a comma)* **Write it.**

What numbers are in the units period? *(five hundred forty-one)*

How do you show the value of five hundred forty-one in standard form? *(5 in the hundreds place, 4 in the tens place, and 1 one)* **Write it.**

What is the standard form of the number? *(32,541)*

Read the next problem. Ready? Read: "Another colony of ants had five thousand, nine hundred thirteen ants. Which colony do you think had more ants? Why?"

How many ants are in this second colony? *(five thousand, nine hundred thirteen)* **Underline it.**

Below the question, write which number you think is greater and why.

Allow time for students to answer the question, then have students share they answers and explanations.

Practice **Time: 8 min**

Activity 1: Students will practice working with different forms of 5-digit numbers.

Have students turn to the ***Practice Sheets*** on pages 42 and 43. Have student ***Value Cards*** available for student use during the practice.

For item #1, dictate **31,912** and **59,813** for students to write.

After item #2,

Say: **What places are in the units period?** *(ones place, tens place, and hundreds place)* **What places are in the thousands period?** *(thousands place and ten thousands place)*

What do you notice about the periods and the word form of a 5-digit number? *(look for answers about breaking the number into periods to write the word form)*

Work with students for items #3-8, gradually fading teacher assistance. Complete both pages. Check for understanding of place value using the following questions:

Say: **What is the difference in writing a 4-digit number and a 5-digit number in expanded form or word form?** *(look for answers about adding another place and value)*

What do you notice about the values in the expanded form and standard form? *(look for answers about the relationship between the values and the digits representing the value in the place)*

Activity 2: Students will play ***Guess My Number*** with a math partner. Each student will be given a card with clues to write a 5-digit number. The student going first will read one clue at a time while their partner fills in the information on a place-value chart at the bottom of the ***Practice Sheet*** on page 43. Once all the clues are read, the partner writes the number in standard form and shares it with the student who read the clues. If correct, the students switch roles; if incorrect the students work together to find the error and correct it.

Independent Practice **Time: 6 min**

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many items as you can. At the end of 5 minutes, we will discuss our answers as a group. For the first item, write the standard form and an expanded form for 63,284.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 8

Expanded Form With Mixed or Missing Values

Lesson Objectives	• The student will write and read 4-digit numbers in base-10 language, standard form, and expanded form with mixed or missing values. • The student will verbally describe the value of each place.	
Vocabulary	**No new words are introduced.**	
Reviewed Vocabulary	base-10 language, expanded form, period, standard form, thousands	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 93-106) • Whiteboard with marker • Value Cards • *Mix the Form!* Cards	• Student Booklet (pp. 47-53) • Value Cards (1 set per student) • Whiteboard with marker (1 per student)

Preview

Say: **Today we will use expanded form to represent numbers in a different way.**

Engage Prior/Informal Knowledge Time: 3 min

Review standard, expanded, and word form for 4- and 5-digit numbers.

Write the following numbers in word form on the whiteboard. Have students use their *Value Cards* to find the expanded form and then overlay their cards to find the standard form.

- Forty-three thousand, six hundred ninety-two
- Sixteen thousand, one hundred eleven
- Eight thousand, four hundred five
- Ten thousand, five hundred seventy-one

Modeled Practice Time: 8 min

1. Demonstrate writing a number in standard form from expanded form with values not in the standard order.

   Have students turn to ***Modeled Practice Sheet #1.*** Point to the expanded form 10,000 + 3,000 + 500 + 20 + 9. Teacher and students will complete the steps as the lesson progresses.

Say: **When we write a number in expanded form, we are writing the value for each place in the number. Most of the time, the values are listed in the order you see on the place-value chart: ten-thousands, thousands, hundreds, tens, and ones.**

Point to the second expanded form 3,000 + 20 + 500 + 9 + 10,000.

Say: **In this example, the values representing each place are in a different order.**

We want to show that even if the values are written in a different order, the expanded form still represents the same

number. Let's compare them by writing each version in base-10 language.

Point to 1 ten thousands in both numbers.

Say: **Compare the base-10 language. Do both numbers have 1 ten thousand?** *(yes)* **Write "1" in the ten thousands place for the standard form of both numbers.**

Point to 3 thousands in both numbers.

Say: **Compare the base-10 language. Do both numbers have 3 thousands?** *(yes)* **Write "3" in the thousands place for the standard form of both numbers.**

Point to 5 hundreds in both numbers.

Say: **Do both numbers have 5 hundreds?** *(yes)* **Write "5" in the hundreds place for the standard form of both numbers.**

Point to 2 tens in both numbers.

Say: **Do both numbers have 2 tens?** *(yes)* **Write "2" in the tens place for the standard form of both numbers.**

Do both numbers have 9 ones? *(yes)* **Write "9" in the ones place for the standard form of both numbers.**

Are the expanded forms equivalent, or the same? *(yes)*

How do you know? *(they have the same values)*

Read the number. *(13,529)*

We have confirmed that both examples of expanded form represent the same number, even though the values are in different orders. This shows we can write the values in expanded form in any order without changing the number it represents.

2. Demonstrate writing the number from standard form to expanded form with the values in a different order.

Write “9,526” on the whiteboard. Have students write the expanded form on the student ***Value Cards***.

Say: **What is one expanded form for 9,526?** *(accept a student answer of the expanded form in any order)*

Have a student share an expanded form with the ***Value Cards***. Leave the ***Value Cards*** on the table.

Say: **What is another way that we can write the expanded form for 9,526?** *(accept a student answer of the expanded order different from the first one)*

Have other students share expanded forms of 9,526 and leave all representations on the table.

Say: **Do these expanded forms all look the same?** *(no)*

Do they all represent the same number? *(yes)*

How do you know? *(the values are in a different order but the numbers are the same)*

Say: **How can we show 9,526 in standard form using the Value Cards?** *(answers will vary; students should indicate that the cards can be put together in such a way to show each place value)*

Have students organize the ***Value Cards*** and show the standard form.

Say: **Because all sets of cards show the same number, we know the expanded forms represent the same number.**

3. Demonstrate completing the expanded form with a missing value.

Have students turn to ***Modeled Practice Sheet #2.*** Point to the equation 4,678 = 4,000 + ___ + 70 + 8. Teacher and students complete the steps as the lesson progresses. Use the ***Value Cards***.

Say: **This number in expanded form has a missing value. We can find the missing value by comparing the expanded form to the standard form. We can model the expanded form and the standard form with Value Cards.**

Write "4,000," "600," "70," and "8" on the *Value Cards*. Hold them up with 1 digit showing for each place.

Say: **What is the number?** *(4,678)*

Display the *Value Cards* in any order on the table.

Say: **What is an expanded form for 4,678?** *(accept a combination of 4,000 + 600 + 70 + 8)* **Write it.**

What value is missing in the expanded form we were given? *(600)* **Fill it in on the missing line.**

Read the expanded form. *(4,000 + 600 + 70 + 8)*

4. Demonstrate a non-example of writing a standard form from an expanded form with values in a different order.

Have students continue on ***Modeled Practice Sheet #2.*** Have students use the *Value Cards* while the teacher demonstrates.

Say: **Read the next problem together. Ready? Read: "In math class, Mandy wrote 3,891 for 300 + 8,000 + 90 + 1. Is Mandy's standard form correct? Explain your answer."**

What is the question asking us to find? *(if the standard form matches the expanded form)*

What did Mandy do when she wrote the standard form? *(she wrote digits in the standard form in the order that the values were listed in expanded form)*

How could we use the Value Cards to show Mandy where she made a mistake? *(we could write the expanded forms using the Value Cards to show the number parts, then overlay the cards to show the standard form)*

What Value Cards would be used for this number? *(8,000, 300, 90,1)* **Fill in your Value Cards.**

Overlay the Value Cards to show the standard form. What is the standard form for 300 + 8,000 + 90 + 1? *(8,391)* **Write it.**

If you have values that are not in order, what could you do to write the correct standard form? *(answers will vary; write the values in order; check that each place has the correct digit; use the Value Cards to help when writing the number)*

Watch For	**Students may confuse the value of each place with the order in which the values appear in expanded form. For example, in 50 + 8 + 2,000 + 300, students might incorrectly say there are 8 hundreds, because 8 is shown in the place typically representing the hundreds value.** **Assist student thinking by pointing to each value and asking students to name the value and which place the value represents.**

Practice
Time: 8 min

Activity 1: Students will practice working with expanded forms.

Have students turn to the ***Practice Sheets* on pages** 49 and 50. Work with students, then gradually fade teacher assistance. Have ***Value Cards*** available for students to use during the practice.

Activity 2: Students will practice concepts while playing ***Mix the Form!*** as a group. Students will use the bottom of the ***Practice Sheet on page*** 50 to show their work.

Place 1 set of ***Mix the Form!* cards** on a whiteboard. Have 1 student mix the order of the cards. Write the addition sign between the cards to create the expanded form of the number. Each student will write the standard form from the expanded form of the cards on the table. Using the same set of cards, flip the cards over. Have another student discard 1 of the cards. Rearrange the cards and have the students determine which value is missing based on the standard form they previously wrote. Discuss any differences in students' answers. Repeat 2-3 times.

During the game, ask questions such as:

- What is another name for the groups of 1,000, groups of 100, groups of 10, or ones? *(look for such answers as 4 hundreds or 400)*
- How do you know to write "___" in the thousands place, hundreds place, tens place, or ones place? *(look for answers relating the value to the place)*
- If I added 3 more groups of 1,000 to that number, what would change? *(look for answers about whether the number moves to the next greater place or not)*

Independent Practice **Time: 6 min**

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible. Repeat the number for item #1 two times.

Say: **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes, we will discuss our answers as a group. For the first item, write the standard form and one expanded form for 99,682.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

ESTAR INTERVENTION

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 9

More Numbers With Zero

Lesson Objectives	• The student will write and read 5-digit numbers including numbers with multiple zeros as placeholders in word form, base-10 form, expanded form, and standard form. • The student will verbally describe the value of each place.	
Vocabulary	**No new words are introduced.**	
Reviewed Vocabulary	expanded form, standard form, ten thousands, word form	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 107-118) • Value Cards with marker • Whiteboard with marker • Number Word Bank	• Student Booklet (pp. 54-59) • Value Cards with marker (1 set per student) • Whiteboard with marker (1 per student) • Number Word Bank (1 per student)

Preview

Say: **Today we will read and write 5-digit numbers with zeros in the number.**

Engage Prior/Informal Knowledge — Time: 3 min

Review numbers with 0.

Write "62,453" on the whiteboard. Ask questions and give directions such as:

- Read this number. *(sixty-two thousand, four hundred fifty-three)*
- What is the value of the 6? *(60,000)*
- What digits are in the units period? *(453)*
- What is the expanded form for 62,453? *(60,000 + 2,000 + 400 + 50 +3)*
- If I change the 5 in the tens place to 0, what the new number? *(62,403)*
- What does the 0 in the tens place represent? *(0 groups of ten)*
- If I change the 2 in the thousands place to 1, what is the new number? *(61,453)*

Modeled Practice — Time: 8 min

1. Demonstrate writing a 5-digit number with 0 in only one of the places in expanded form and word form.

   Use ***Modeled Practice Display #1*** and point to the number 80,532. Teacher and students complete the steps as the lesson progresses.

Say: **Read the number.** *(eighty thousand, five hundred thirty-two)*

What does the 0 represent in the number? *(0 groups of a thousand)*

Point to the expanded form line.

Say: **We will write this number in expanded form.**

Because there are no groups of 1,000 in the thousands place, we do not need to have a value for the thousands place in expanded form.

What is the expanded form? *(80,000 + 500 + 30 + 2)*

When we write the word form, we will think about each period separately.

Starting with the thousands period, what number is to the left of the comma? *(80)* **Write "eighty thousand" and a comma on the word form line.**

Slide your finger under 532.

Say: **In the units period, what is the number to the right of the comma?** *(532)* **Write "five hundred thirty-two" on the line.**

Read the word form. *(eighty thousand, five hundred thirty-two)*

2. Demonstrate reading a 5-digit number with 2 zeros in the number.

Have students turn to ***Modeled Practice Sheet #2*** and point to 60,408.

Say: **Let's read this number together, starting in the thousands period.**

Cover the units period with your hand.

Say: **What number is showing?** *(60 thousand)*

Now look at the units period.

Cover the thousands period with your hand.

Say: **What is the number?** *(408)*

Read the number altogether: 60,408. *(sixty thousand, four hundred eight)*

What places do not have any groups? *(thousands place and tens place)*

What do we know about places that do not have any groups? *(we use a 0 digit to show the 0 value for those places)*

3. Demonstrate writing the expanded form for a 5-digit number with 2 zeros in the number. Continue using ***Modeled Practice Sheet #2***. Teacher and students complete the steps as the lesson progresses.

Point to the 0s in the standard form.

Say: **What is the value of the first digit?** *(60,000)* **Write it.**

What is the value of the next digit? *(0)* **Since the value is 0 we will not write anything for that place.**

What is the next place that has a value greater than 0? *(hundreds)*

What is the value of the hundreds place? *(400)* **Write it.**

What is the last value we should write for the expanded form? *(8)* **Write it.**

What is the expanded form for 60,408? *(60,000 + 400 + 8)*

What is another expanded form for 60,408? *(accept different expanded forms with values of 60,000, 400, 8)*

4. Demonstrate writing the word form for a 5-digit number with 2 zeros in the number. Continue using ***Modeled Practice Sheet #2***. Teacher and students complete the steps as the lesson progresses. Allow students to use the ***Number Word Bank*** for spelling assistance.

Say: **To write the number in word form, we start with the thousands period.**

Point to the 60 thousand.

Say: **What number is to the left of the comma?** *(60 thousand)*

Write "sixty," followed by "thousand" and a comma to separate the two periods.

What number is to the right of the comma in the units period? *(408)*

Write "four hundred eight" for the units period.

This number is shorter in word form than other 5-digit numbers because we only write the values we hear when we say the number.

5. Demonstrate writing the standard form from word form for a 5-digit number with 2 zeros in the number.

Have students turn to ***Modeled Practice Sheet #3***. Teacher and students complete the steps as the lesson progresses.

Say: **Read the number: "eighty-one thousand, three."**

We will write the standard form for this number.

The number is in the ten thousands, so how many digits will be in the standard form? *(5)*

Draw 5 lines on the standard form line.

Say: **To help us remember that this is 5-digit number, draw 5 lines, one for each place. What number is in the thousands period?** *(eighty-one)*

81 is part of the thousands period. 8 is in the ten thousands place. Write "8" on the first line for 8 groups of 10,000.

1 is in the thousands place. Write "1" on the second line for 1 group of 1,000.

What number is in the units period? *(3)*

What is the value of 3 and which place should it be written? *(3 and in the ones place)* **Write a "3" on the last line in the ones place.**

Have we written all of the digits for the standard form? *(no)*

What do I still need to write? *(0s for the hundreds and the tens places)* **Write "0" for the third and fourth line.**

Why did we need zeros for the hundreds place and the tens place? *(we use the digit 0 to show the value that has 0 groups in that place)*

Read the number. *(eighty-one thousand, three)*

6. Demonstrate a non-example of multiple 0s in a number. Have students continue on *Modeled Practice Sheet #3*. Teacher and students complete the steps as the lesson progresses.

Say: **Read the next problem together. Ready? Read: "Mack's teacher told the class to write the number twenty thousand, fourteen. Mack wrote 20,000,14 on his paper. Did Mack write the number correctly?"**

What can you tell me about the number Mack wrote? *(accept reasonable answers that may include: he wrote too many digits, he has 2 commas in his number, his number is too big)*

How many digits should Mack have written? *(5 digits, because it has a value in the ten thousands place)* **Draw 5 lines, one for each place.**

What number will be in the thousands period? *(20)* **Write it.**

What number will be in the units period? *(14)* **Write it.**

Which places have 0 groups? *(thousands and hundreds)* **Write a "0" in the hundreds place.**

What is the correct standard form for twenty thousand, fourteen? *(20,014)*

Did Mack write the number correctly? *(no)*

Practice — Time: 8 min

Activity 1: Students will practice matching word forms of 5-digit numbers.

Have students turn to the ***Practice Sheet on page*** 57. Students will work with a math partner to complete the multiple choice and matching questions.

Say: **Work with your partner to choose the correct word form or standard form for each number.**

Review students' answers before moving on to Activity 2.

Activity 2: Students will play ***Write It***. Distribute a whiteboard with marker to each student. The students will write the number you read in standard form. Next the students will write the word form for the number you show in standard form. Students may use the ***Number Word Bank*** to help with the written form of the number.

Say: **Write the numbers as I read them to you. Remember to listen carefully to each place. If you do not hear the place in the number, what digit must you write to show there are no groups in the place?** *(0)* **If you heard a number in the ten thousands place, how many digits will be in that number?** *(5)*

60,048

42,009

70,072

15,009

Say: **Erase your boards. Now I will show you a number and you will write the word form. You may use the Number Word Bank to help with spelling.**

36,800

11,002

Independent Practice Time: 6 min

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many as you can. At the end of 5 minutes, we will discuss our answers as a group. For the first two items, write these 2 numbers in standard form and expanded form: 50,102 and 71,009.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

ESTAR INTERVENTION

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 10

Read and Write 6-Digit Numbers

Lesson Objectives	• The student will write and read whole numbers up to 999,999 in base-10 form, standard form, expanded form, and word form. • The student will verbally describe how and why numbers are moved to the next greater place.	
Vocabulary	**hundred thousands:** the place-value position that is equal to one hundred thousand times the unit value	
Reviewed Vocabulary	digits, hundreds, ones, period, ten thousands, tens, thousands	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 119-130) • Whiteboard with marker • Value Cards with marker • Number Word Bank sheet • *Make it 6!* cards • Sheet protector and marker	• Student Booklet (pp. 60-65) • Whiteboard with marker (1 per student) • Value Cards with marker (1 set per student) • Number Word Bank sheet (1 per student)

Preview

Say: **Today we will read and write 6-digit numbers.**

Engage Prior/Informal Knowledge **Time: 3 min**

Review the concept of 0s in a 5-digit number.

Distribute a whiteboard and marker to each student. Read the following numbers to students. Have students read and write the number, then write the expanded form of each number.

- Sixty thousand, three hundred four
- Ninety-nine thousand, fifty-one
- Thirteen thousand, eight hundred seventy-five
- Ten thousand, eleven

Ask question such as:

- What is the greatest place in the number? *(ten thousand or thousand)*
- How many digits are in this number? *(5 or 4)*
- How many digits do you hear in the number? *(answers will vary depending on the number)*
- What place do you not hear? *(answers will vary depending on the number)*
- What is the value of the ten thousands [thousands, hundreds, tens, or ones] place? *(answers will vary)*

Modeled Practice **Time: 8 min**

1. Demonstrate working with the next greater place value, hundred thousand. Use the *Value Cards*.

Display 87,564 on the teacher's *Value Cards* in standard form.

Say: **What number?** *(87,564)*

If I add 5 groups of 10,000 to the ten thousands place, how many groups of 10,000 will I have? *(13 groups of 10,000)*

Erase the 8 in the thousands place on the ten thousands value card and write "13."

Say: **How many groups of 10,000 do I have?** *(13)*

Is this the correct way to show this number in standard form? *(no)*

What is wrong with this standard form? *(we cannot have more than 9 in any place)*

What should we do when we have more than 9 in any place? *(trade 10 groups for 1 group of the next greater place).*

Point to the 13 groups in the ten thousands place.

Say: **I need to take 10 groups of 10,000 and trade or regroup with 1 group of the next greater place.**

Pick up the 100,000 *Value Card*, show to students, and add to the back of the *Value Cards*. Circle the 10 groups of 10,000 on the ten thousands *Value Card*.

Say: **The next greater place after the ten thousands place is the *hundred thousands* place. What is the next greater place after the ten thousands place?** *(the hundred thousands place)*

The *hundred thousands* are part of the thousands period. What places make up, or are part of, the thousands period? *(hundred thousand, ten thousand, thousand)*

I trade or regroup 10 groups of 10,000 for 1 group of 100,000. What is 13 groups of 10 thousand minus 10 groups of ten thousand? *(3 ten thousand)*

Erase the 10 groups of 10,000 (leaving 3 groups of 10,000) and write "1" on the 100,000 value card. The value cards should show 137,564.

Say: **The new number is 137,564.**

What is the new number? *(137,564)*

Take the hundred thousands *Value Card* out to show students.

Say: **The *hundred thousands* place is equal to 100,000 ones or 10 groups of 10,000.**

How many groups of 1,000 would be equal to 10,000? *(you may need to remind students that 10,000 is equal to 10 groups of 1,000, so 100,000 would be equal to 100 groups of 1,000)*

2. Demonstrate periods in the place-value chart.

Using *Modeled Practice Sheet #1*, point to the units period in the place-value chart. Teacher and students complete the steps as the lesson progresses.

Say: **Working with numbers into the thousands, we learned that a period is a group of 3 digits in a number. What places are in the units period?** *(ones place, tens place, and hundreds place)*

What are the digits in the units period? *(695)*

Point to the thousands period on the place-value chart.

Say: **The thousands period contains the thousands, ten thousands, and *hundred thousands* places.**

What digits are in the thousands period? *(271)*

How many total digits are in this number? *(6)*

3. Demonstrate writing a 6-digit number in expanded form. Distribute the *Value Cards* to the students.

Say: **Writing a 6-digit number in expanded form requires the same steps as a 5-digit number except there is an added value for the *hundred thousands* place.**

Show the hundred thousands *Value Card*.

Say: **The 2 in the *hundred thousands* place represents 200,000. Write "200,000" on the *hundred thousand* Value Card.**

What is the value of the ten thousands place? *(70,000)* **Write it on the ten thousand Value Card.**

What is the value of the thousands place? *(1,000)* **Write it.**

Write the units period in expanded form using the Value Cards.

Allow 7-10 seconds for students to finish filling in the *Value Cards*.

Say: **What are the values for the hundreds, tens, and ones value cards?** *(600, 90, and 5)*

What is the expanded form of this number? *(200,000 + 70,000 + 1,000 + 600 + 90 + 5)*

Point to the standard form line on *Modeled Practice Display #1*.

Say: **Write the number in standard form. Overlay your Value Cards so the first digit on each card is showing.**

Cover the units period with your hand on the place-value chart.

Say: **What 3-digit number do we have in the thousands period?** *(271)* **Write it.**

What 3-digit number do we have in the units period? *(695)* **Write it.**

What do we write between the periods to help us read the number? *(comma)* **Write it.**

To read a 6-digit number, we look at the number to the left of the comma first.

Slide your finger under 271 in the thousands period.

Say: **What number is to the left of the comma in the thousands period?** *(271)*

What does the comma remind us to say? *(thousand)*

Slide your hand to cover the thousands period.

Say: **What number is to the right of the comma?** *(695)*

What is the number altogether? *(two hundred seventy-one thousand, six hundred ninety-five)* **Write "271,695" on the standard form line.**

4. Demonstrate writing a 6-digit number in word form.

Point to the word form line on ***Modeled Practice Display #1.*** Distribute a ***Number Word Bank*** to each student.

Say: **Writing a 6-digit number in word form requires the same steps as a 5-digit number, except there is one additional place. It is helpful to think of the 2 periods in the number when writing the word form.**

Cover the units period with your hand.

Say: **What number is in the thousands period?** *(271)* **Write "two hundred seventy-one thousand" on the word form line.**

Why do you write "thousand"? *(because it is in the thousands period)*

Allow 7-10 seconds for students to write the word form on the line. Slide your hand to cover the thousands period.

Say: **What number is in the units period?** *(695)*

Write "six hundred ninety-five" on the word form line. What goes in between the two periods to help us read the number? *(comma)* **Write it.**

Allow 7-10 seconds for students to write the word form on the line.

Say: **Read the word form.** *(two hundred seventy-one thousand, six hundred ninety-five)*

Watch For	**Students may have difficulty writing the word form of a 6-digit number, such as with spelling or writing the correct places.** **For example, for 538,264, students may write "fifty-three eight thousand, two hundred sixty-four" instead of "five hundred thirty-eight thousand, two hundred sixty-four."** **Reinforce for students the proper writing of numerals by:** **•having students find the number words in the Number Word Bank to help with spelling.** **•having students break the number into periods, reading the 3-digit number in that period and then writing it in words.**

5. Demonstrate writing the standard form of a number in word form.

Using *Modeled Practice Sheet #2*, point to seven hundred fifty thousand, four hundred sixteen. Teacher and students complete the steps as the lesson progresses.

Say: **Read the number in word form. Ready? Read: "seven hundred fifty thousand, four hundred sixteen." We will write the standard form for this number.**

Point to seven hundred fifty thousand.

Say: **When you read or write the word form of a 6-digit number, you begin with the number in the thousands period. What is the number in the thousands period?** *(seven hundred fifty thousand)*

How do you show the value of seven hundred fifty thousand in standard form? *(7 in the hundred thousands place, 5 in the ten thousands place, and 0 in the thousands place with a comma)* **Write "750" on the blank before the comma.**

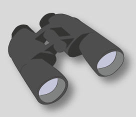
Why is there a 0 in the thousands place? *(because there are 0 groups of 1,000)*

Point to four hundred sixteen.

Say: **What numbers are in the units period?** *(four hundred sixteen)*

How do I show the value of four hundred sixteen in standard form? *(4 in the hundreds place, 1 in the tens place, and 6 ones)* **Write "416" on the blank after the comma.**

What is the standard form of the number? *(750,416)*

Watch For 	**Students may have difficulty writing the standard form of a 6-digit number from word form.** **For example, students may write "six hundred twenty-four thousand, three hundred fifty-six" as "60024,30056."** **Have the students first identify the number of digits in the number. Then have students draw a line for each digit. Have students identify each place and its value while writing the number in standard form.**

Practice **Time: 8 min**

Activity 1: Students will practice writing 6-digit numbers in standard form, expanded form, and word form.

Have students turn to the ***Practice Sheets on pages*** 62 and 63. Have ***Value Cards*** and the ***Number Word Bank*** available for student use during practice.

For item #1, dictate "**435,681**" and "**760,280**" for students to write.

Work with students on the rest of the items, gradually fading teacher assistance. Complete both pages.

Activity 2: Students will practice concepts while playing ***Make It 6!*** as a group. Use the ***Make It 6!* cards*, Place-Value Chart*** (in a sheet protector with a marker) and ***Value Cards***.

Place the 2 stacks of number cards facedown and the ***Place-Value Chart*** (in a sheet protector with a marker) on the table. Have one student pick 3 orange numbers cards and write the digits for the thousands period. Have another student pick 3 blue number cards and write the digits for the ones period. Have a student build the expanded form with *Value Cards* and another student build the standard form with *Value Cards*. Have another student read the expanded form and standard form. Repeat 1-2 times.

During the game, ask such questions as:

- What is another name for the groups of 100,000, groups of 10,000, groups of 1,000, groups of 100, group of 10, or ones? *(look for such answers as 4 hundreds or 400)*
- How do you know to write "___" in the hundred thousands place, ten thousands place, thousands place, hundreds place, tens place, or ones place? *(look for answers relating the value to the place)*
- If I added another group of 10,000 to that number, what would change? *(look for answers about whether the number moves to the next greater place or not)*

Independent Practice Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many items as you can. At the end of 5 minutes, we will discuss our answers as a group. The first number is 639,482. Write the number in standard form and in the Value Card blanks.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

ESTAR INTERVENTION

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 11

Digits and Value of Whole Numbers

<table>
<tr><td rowspan="1">Lesson Objectives</td><td colspan="2">• The student will use his or her knowledge of place value by creating numbers with different values and finding missing values from expanded form.
• The student will use place value language to explain his or her reasoning.</td></tr>
<tr><td>Vocabulary</td><td colspan="2">No new words are introduced.</td></tr>
<tr><td>Reviewed Vocabulary</td><td colspan="2">digit, expanded form, place value, thousands</td></tr>
<tr><td rowspan="2">Instructional Materials</td><td>Teacher</td><td>Student</td></tr>
<tr><td>• Teacher Masters (pp. 131-138)
• Whiteboard with marker
• Value Cards and marker
• Number cards with digits from 0-9</td><td>• Student Booklet (pp. 66-69)
• Value Cards with marker (1 set per student)
• Whiteboard with marker (1 per student)</td></tr>
</table>

Preview

Say: **Today we will do some detective work with 4-digit numbers to create numbers with different values and find missing values.**

Engage Prior/Informal Knowledge — Time: 3 min

Build the greatest value number with a given number of digits.

Write the digits "3," "7," "5," and "2" on the whiteboard. Distribute a whiteboard with marker to each student. Draw 4 short horizontal lines on the whiteboard. Have students do the same.

Say: **What digits?** *(3, 7, 5, 2)*

You will write a digit on each line. When we have a 4-digit number, what place values are in that number? *(ones, tens, hundreds, and thousands)*

What is the value of a 4-digit number? *(thousands)*

Arrange the 4 numbers to create a 4-digit number with the greatest value. What number will be in the thousands place? *(7)* **Why?** *(it has the greatest value of the 4 numbers)* **Continue to write the number with the greatest value.**

Allow 5-7 second for students to arrange the 4 digits to create their number. Have the students compare their answer with a math partner, then discuss the answers as a group. Write "7,532" on the whiteboard.

Say: **What is the greatest number with these 4-digits?** *(7,532)*

Modeled Practice — Time: 8 min

1. Build the least value number with a given number of digits.

Using the same 4 digits (7, 5, 3, 2), have students create the number with the least value. Draw 4 more short horizontal lines on the whiteboard under the first number. Have students do the same.

Say: **Look at the number 7,532. What observations can you make about this number?** *(accept reasonable answers that include that the digits in the number are in descending order)*

This is the largest number using these digits because we started with the largest value digit and then arranged the digits so each place had a smaller value than the place before it.

Create a number using the same digits that has the least value. Think to yourself how you should arrange the digits.

Allow 5-7 second for students to arrange the 4 digits to create their number. Have the students compare their answer with a math partner, then discuss the answers as a group. Write "2,357" on the whiteboard.

Say: **What is the least value number with these 4-digits?** *(2,357)*

How did you arrange the digits? *(in order from least to greatest)*

When the place of a digit changes, the value also changes. What was the value of the 2 in the number 7,532? *(2)* **What was the value of the 2 in the number 2,357?** *(2,000)*

2. Write the numbers in expanded form using the *Value Cards*.

Distribute *Value Cards* to each student. Use the greatest number created, 7,532, and the least number, 2,357, to write the expanded form. Have students work with a math partner. The students will use 1 set of *Value Cards* for the greatest number and the other set for the least number.

Say: **Work with your math partner. Using only 1 of your sets of Value Cards, we will write the value for each digit of 7,532. What is the value of the first digit?** *(7,000)* **Write it.**

What is the value of the second digit? *(500)* **Write it.**

Work with your partner to fill in the last 2 Value Cards.

Allow 5-7 seconds for students to complete the task.

Say: **What is the expanded form for 7,532?** *(7,000 + 500 + 30 + 2)*

Using your other set of Value Cards, work again with your partner to write the expanded form for 2,357.

Allow 15-20 seconds for students to complete the task.

Say: **What is the expanded form for 2,357?** *(2,000 + 300 + 50 + 7)*

3. Students will determine which digit is missing from the expanded form.

Have students continue to use the *Value Cards* that were completed in step #2. Students will work again with their math partner to find the missing value in the expanded form.

Say: **The student with the largest number written on their Value Cards will go first. Partners turn around so you can't see the Value Cards.** *(check that students have turned their bodies so they are not looking at the cards on the table)*

When your partner is not looking, remove one of the values from the expanded form.

Allow 3 seconds for the first student to remove a card.

Say: **Tell your partner when you are ready for them to turn around and look at the Value Cards.**

Partners, remember the number is written on the whiteboard. Look at the standard form of the number and then at the Value Cards with 1 missing value. Tell your partner which value is missing. *(answers will depend on which value the students removed)*

Show your partner the missing value. Were they correct? *(answers will vary)*

Now switch positions. The partner who guessed will remove a Value Card from the set of the least number. The other partner will turn around and then have to guess which number is missing.

Allow time for students to remove a card and have their partner guess. Remind students to look at the standard form of the number on the whiteboard.

4. Add the values to find the total or the standard form of the number.

Distribute a ten thousand *Value Card* to each student. Have students continue to use the *Value Cards* they have made from step #2. Some students will have 7,532 and some will have 2,357.

Say: **Write "60,000" on the new Value Card. Place it in front of your other Value Cards on the table.**

Students' cards should be lined up in a horizontal line with the greatest value to the left and then in descending order.

Say: **What is your number in standard form?** *(67,532 or 62,357)*

To check if you are correct, arrange the Value Cards so that 1 card is above the other, going down the table.

Demonstrate moving 1 *Value Card* in front of them and positioning another *Value Card* directly below it so that both cards are showing. Do not line up the place values at this time. Allow time for students to position their *Value Cards* vertically.

Demonstrate on the whiteboard the misalignment of places when adding the numbers vertically.

Say: **We must be careful when adding values together. Can we add the 2 from 2,000 plus the 3 from 300 to get 5,000?** *(no)* **Why not?** *(the digits are different values)*

Correct, when adding values we need to add ones to ones, tens to tens, hundreds to hundreds, and thousands to thousand.

What do we have to make sure we do when arranging these cards to add? *(make sure the place values are in line with each other)*

To help us align the places we can imagine a wall to the right of the numbers. All the cards must have their right side against

the wall. Look down at your cards. Make sure all the cards are lined up evenly to the right.

Place your whiteboard at the bottom of the Value Cards. Add each place and find the total for your cards.

Allow 7-10 seconds for students to find the total.

Say: **Is your total after you added, the same as what you thought the standard form of the number would be?** *(yes)*

Overlay your value cards so that the first digit of each card is showing. Does it match? *(yes)*

Practice — Time: 8 min

Activity 1: Students will practice finding the missing value from the expanded form and adding the values vertically.

Have students turn to the ***Practice Sheets*** on pages 66 and 67. Students may work with a partner to complete the sheet.

Say: **Work with your math partner to complete the sheets. Find the missing value and add the values to check that the standard form is correct.**

Activity 2: Students will practice concepts while playing the ***Greatest or Least?*** game.

Play ***Greatest or Least?*** using a set of cards with numbers 0 to 9. 1 student will shuffle the deck of cards then deal out 4 [or 5] cards to each student. Prior to dealing the cards, the dealer will choose if the round is a "greatest" or "least" round. If greatest, everyone will create the greatest number possible with the cards they are dealt. In a least round, the students will create the least-valued number. When every student has made a number with the cards, students reveal the cards and read the number. If the student has correctly arranged their cards to make the greatest or least value number possible from the cards they were dealt, they receive a point. Everyone returns their cards to the dealer, who passes the deck to the player to their left and the game repeats.

Independent Practice Time: 6 min

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many items as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 12

Comparing 4-Digit Numbers

<table>
<tr><td>Lesson Objectives</td><td colspan="2">• The student will compare 4-digit numbers using the place-value chart.
• The student will use comparison language correctly when comparing numbers.</td></tr>
<tr><td>Vocabulary</td><td colspan="2">compare: to determine whether a number is greater than or less than another number</td></tr>
<tr><td>Reviewed Vocabulary</td><td colspan="2">equivalent, greater than, hundred thousands, less than, period, ten thousands</td></tr>
<tr><td rowspan="2">Instructional Materials</td><td>Teacher</td><td>Student</td></tr>
<tr><td>• Teacher Masters (pp. 139-153)
• Whiteboard with marker
• Value Cards and marker
• Number cards with digits from 0-9</td><td>• Student Booklet (pp. 70-77)
• Value Cards and marker (1 set per student)</td></tr>
</table>

Preview

Say: **Today we will *compare* numbers to identify if the first number is greater than or less than the second number.**

Engage Prior/Informal Knowledge — Time: 3 min

Review the terms “less than” and “greater than.”

Have students turn to the *Engaged Practice Sheet*. Teacher and students complete the sheet as the lesson progresses.

Say: **When we *compare* 2 numbers, we determine whether a number is greater or less than another number. We use the words “greater than” and “less than.”**

***Compare* 53 and 27. Is 53 greater than or less than 27?** *(greater than)* **How do you know?** *(53 has more groups of ten)* **Write the “greater than” sign.**

***Compare* 128 and 604. Is 128 greater than or less than 604?** *(less than)* **How do you know?** *(100 is less than 600)* **Write the “less than” sign.**

What place do you look at first when comparing 2 numbers? *(the greatest place value)*

Complete the next 3 problems. Use the greater than or less than sign for each problem.

Discuss the answers when students have finished.

Modeled Practice **Time: 8 min**

1. Compare 2 numbers to see if the first number is greater than or less than the second number.

   Have students turn to ***Modeled Practice Sheet #1***. Point to the base-10 picture for the first number.

Say: **How many groups of 1,000?** *(6)* **Write "6" in the thousands place on the chart.**

Have students finish the place-value chart for the first number.

Say: **What number?** *(6,331)*

Point to the base-10 materials for the second number.

Say: **How many groups of 1,000?** *(6)* **Write "6" in the thousands place on the chart.**

Have students help finish the place-value chart for the second number.

Say: **What is the number?** *(6,525)*

How many digits are in both numbers? *(4)*

When we *compare* numbers we start with the greatest place value, just like when we read the number. Where do we look first when *comparing* numbers? *(the greatest place value)* **What is the greatest place in these numbers?** *(the thousands place)*

Are the digits in the thousands place the same or different? *(the same)*

Can you tell by looking at only the thousands place which number is greater? *(no)* **Why not?** *(because both numbers have 6 in the thousands place)*

Since the values of the digits in the thousands place are the same, we can't identify the greatest or least number, so we look to the next place to the right.

What is the next place to the right? *(the hundreds place)*

What are the values of the digits in the hundreds place? *(300 and 500)* **Can you *compare* 300 to 500?** *(yes)*

Since the values of the digits in the hundreds place are different, we will *compare* the hundreds place to identify if the first number is greater than or less than the second number.

Is 300 greater than or less than 500? *(less than)*

Since 300 is less than 500, then 6,331 is less than 6,525.

Do we need to look at the tens or ones place to compare these numbers? *(no)* **Why not?** *(3 hundreds is less than 5 hundreds no matter how many tens or ones the number has)*

At the bottom of the page write "6,331" and "6,525" on the blanks provided. In the circle, we will write the "less than" symbol to make the sentence true.

The "less than" symbol points towards the less than number. Read the compare sentence with me: "6,331 is less than 6,525."

Check that students have also written in the correct symbol in the circle.

2. Compare 2 numbers to see if the first number is greater than or less than the second number.

   Use *Modeled Practice Display #2*.

Say: **Let's read the problem at the top of the page together. Ready? Read: "Miguel and Cameron played a video game. Miguel's score was 7,895. Cameron's score was 7,859. Miguel says his score is higher. Is he correct?**

What is the question asking us to find? *(if Miguel's score is greater than or less than Cameron's)*

What was Miguel's score? *(7,895)* **What was Cameron's score?** *(7,859)*

Write the two numbers to be *compared* in the place-value chart to identify whose score was the greatest.

Assist students in completing the place-value chart. Check students' work carefully as the numbers are very similar and can easily be transposed.

Say: **To *compare* the numbers, where do we start?** *(the greatest place value)*

Point to the thousands place on the place value chart.

Say: **Start in the greatest place. What is the greatest place?** *(thousands)* **Are the values of the digits in the thousands place different?** *(no)* **Can we identify the greatest number by *comparing* the thousands place?** *(no)*

Point to the hundreds place on the place-value chart.

Say: **What is the next greatest place?** *(hundreds)* **Are the values of the digits in the hundreds place different?** *(no)*

Point to the tens place on the place value chart.

Say: **What is the next place we should *compare*?** *(tens)* **Are the values of the digits in the tens place different?** *(yes)*

How are the values in the tens place different? *(the first digit has a value of 90 and the second digit has a value of 50)*

Is 90 greater than or less than 50? *(greater than)*

How do you know? *(9 tens are greater than 5 tens)*

Is 7,895 greater than or less than 7,859? *(greater than)*

Was Miguel correct – did he score higher than Cameron? *(yes)*

Watch For	**Students may struggle with comparing numbers without a picture.** **Have students draw a base-10 picture or build the number using base-10 materials to identify the greater value.**

Say: **Write the two scores in a comparison sentence. Write "7,895" on the first line and "7,859" on the second line. In the middle of the circle, write the "greater than" symbol. The "greater than" symbol opens wide to the greater number.**

Check that students have written the correct symbol in the circle.

3. Compare a 3-digit number with a 4-digit number using the "greater than" and "less than" symbols.

Watch For	**Students may have difficulty completing the place-value chart without a concrete or pictorial representation of the number parts.** **For example, students may not know that there are 9 tens in 4,092.** **If this occurs, allow students to build the numbers with base-10 materials, Value Cards, or have them draw base-10 pictures.**

Have students turn to *Modeled Practice Sheet #3*.

Say: **Read the problem together. Ready? Read: "Travis is comparing numbers in science class. He is *comparing* 6,492 to 794. Travis says 6,492 is less than 794 because 6 is less than 7. Is Travis correct?"**

What is the question asking us to find? *(if Travis' comparison is correct)*

What numbers are we *comparing* in the problem? *(6,492 and 794)*

Write the first number in the place-value chart. How many thousands are in 6,492? *(6 thousands)*

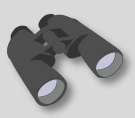
Write the second number in the place-value chart. How many thousands are in 794? *(0 thousands)* **Do you need to write a "0" in the thousands place in the place-value chart?** *(no)* **Why not?** *(you do not have to write "0" for a place that is greater than the greatest place with a digit that is not 0)*

Where is the first place that the digits are different? *(the thousands place)*

Is 6 thousands greater than or less than 0 thousands? *(greater)*

Do we need to look at any other places to determine if 6,492 is greater than or less than 794? *(no)* **Write "6,492" and "794" on the lines below the place-value chart.**

Watch For



Students may have difficulty comparing numbers with different numbers of digits. For example, students may think 9 tens is greater than 3 hundreds when comparing 98 and 301 because the digit 9 is greater than the digit 3. Remind students of the value of the digit and that the place in the number matters more than which digit it is. Also relate the numbers to money. Ask the students, "Which is more money, $90 or $300? Does it matter that 9 is greater than 3? No, because it is the place of the digit that tells us its value. "

Which symbol should we write in the circle to make this a true statement? *(>, greater than symbol)*

Check that students know which symbol is the "greater than" symbol. Demonstrate the symbol on your own sheet.

Say: **Read the sentence with me: "6,492 is greater than 794."**

What was Travis' mistake? *(he only looked at the digits and not the place or value of each digit; 6 thousands is greater than 7 hundreds)*

Practice **Time: 8 min**

Activity 1: Students will practice comparing numbers.

Have students turn to the ***Practice Sheets*** on pages 74 and 75. Work with students for items #1-3. Check for understanding of comparing using the following questions:

Say: **How did you know what digits of the 2 numbers to *compare*?** *(look for the greatest place that the numbers are different)*

What is the greatest place value where the numbers are different? *(look for understanding of finding the greatest place value where the numbers are different)*

Is the first number greater than or less than the second number? *(look for language that the first number should be compared to the second number)*

How do you know? *(look for answers about place value)*

Gradually fade teacher assistance. Complete both pages.

Activity 2: Play ***Stay and Play*** using a set of cards with numbers 0 to 9. 1 student will shuffle the deck of cards, then deal out 4 [or 5] cards to each student. Students will arrange their cards to create a number with the greatest value possible. Once students create their number from their cards they must declare if they are "Staying" or "Playing." If the student thinks they have a number with a greater value than other students' numbers they will say, "Play." If students think their number is less than others' numbers they can say, "Stay." When every student has stated if they are staying or playing, they reveal their cards and read their number to the group. The student with the greatest value of the group collects the cards from the other players that "played" that round. Any students who "stayed" keep their own cards. The student with the most cards at the end of the game wins.

Independent Practice Time: 6 min

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many items as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

ESTAR INTERVENTION

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 13

Comparing Multi-Digit Numbers

Lesson Objectives	• The student will compare multi-digit numbers using the place-value chart. • The student will use comparison language correctly when comparing multi-digit numbers.	
Vocabulary	**No new words are introduced.**	
Reviewed Vocabulary	compare, greater than, hundreds, less than, ones, place value, tens, thousands	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 155-170) • Whiteboard with marker • Value Cards with marker • Number cards with digits from 0-9	• Student Booklets (pp. 78-85) • Value Cards with marker (1 set per student)

Preview

Say: **Today we will continue to compare numbers.**

Engage Prior/Informal Knowledge — Time: 3 min

Have student turn to the ***Engaged Practice Sheet*** to practice comparing 2- and 3-digit numbers using the <, >, and = signs. Write the symbols on the whiteboard to review the meaning of each.

Ask questions such as:

- What does < mean? *(less than)*
- What does > mean? *(greater than)*
- What does = mean? *(same as or equal)*
- Where do you start when comparing numbers? *(start with the number with the greatest place value in each)*
- How do you compare numbers that have the same first digit? *(compare the digits in the next place to the right)*
- Is 99 greater than or less than 393? *(less than)* Why? *(99 has 0 groups of 100 and 393 has 3 groups of 100)*

Modeled Practice — Time: 8 min

1. Compare 2 numbers to see if the first number is greater than or less than the second number.

   Have students turn to ***Modeled Practice Sheet #1***. Point to the base-10 picture for the 2 numbers. Teacher and students will complete the steps as the lesson progresses.

Say: **We have 2 numbers to compare. I want to see if the first number is greater than or less than the second number.**

Point to the base-10 picture for the first number.

Say: **How many groups of thousands?** *(0)* **Do we need to write "0" in the thousands place on the chart?** *(no)* **Why not?** *(you do not have to write "0" for a place that is greater than the greatest place with a digit that is not 0)*

Have students complete the remaining columns of the place-value chart.

Say: **What number?** *(935)*

Point to the base-10 picture for the second number.

Say: **How many groups of thousands?** *(8)* **Write "8" in the thousands place on the chart.**

Have students complete the remaining columns of the place-value chart.

Say: **What number?** *(8,483)*

Point to the numbers in the place-value chart.

Say: **How many digits in 935?** *(3)*

How many digits in 8,483? *(4)*

When you compare numbers that have different numbers of digits, the number with the value in the greatest place is the greater number.

Point to the thousands place in the place-value chart.

Say: **What is the greatest place value in these 2 numbers?** *(thousands place and hundreds place)*

Does 935 have any digits of value in the thousands place? *(no)*

What is the value of the digit in the thousands place in 8,483? *(8,000)*

The 2 numbers have different values in the thousands place.

Is 935 greater than or less than 8,483? *(less than)* **How do you know?** *(935 has no value in the thousands place, 8,483 has 8* *groups of 1,000)* **At the bottom of the page write "935" and "8,483" on the lines.**

Say: **What symbol will you write in the circle?** *(<, less than)* **Write it. Read the comparison sentence with me: "935 is less than 8,483."**

2. Compare 2 numbers to see if the first number is greater than or less than the second number.

   Have students turn to ***Modeled Practice Sheet #2***. Point to the 2 numbers. Teacher and students will complete the steps as the lesson progresses.

Say: **What are the 2 numbers we are comparing?** *(40,920 and 40,290)*

Have students complete the columns of the place-value chart.

Say: **To compare the numbers, what is the first thing I should do?** *(find the greatest place value in which the numbers are different)*

Point to the places on the place value chart.

Say: **What is the greatest place value of each of number?** *(ten thousands)*

Is the value of the digits in the ten thousands place the same or different? *(same)*

What do we do next? *(move to the next place value to the right)* **Why?** *(we can't compare when the value is the same)*

Are the values of the digits in the thousands place the same or different? *(same)*

What do we do next? *(move to the next place value to the right)*

Are the values of the digits in the hundreds place the same or different? *(different)*

What is the value of the hundreds place for each number? *(900 and 200)*

Can we compare the 2 numbers to find the greater than or less than number? *(yes)*

Write the numbers in the blanks at the bottom of sheet.

Which symbol would you write in the circle to make the statement true? *(>, greater than)*

Read the comparison sentence with me: "40,920 is greater than 40,290."

3. Compare 2 numbers using a non-example.

Say: **Read what Molly did when comparing 2 numbers in a place-value chart. Ready? Read: "Molly said that 9,965 was greater than 11,125 because 9 is greater than 1. Was Molly correct?"**

What is the question asking you to find? *(if Molly compared the 2 numbers correctly)*

Write the 2 numbers in the place-value chart to help us compare.

What is the first number? *(9,965)* **Where in the chart do you write the "9" for 9,965?** *(in the thousands column)*

What is the second number? *(11,125)* **Where in the chart do you write the first "1" for 11,125?** *(in the ten thousands column)*

What is the greatest place value of these 2 numbers? *(ten thousand and thousand)*

Do the numbers have the same value in the ten thousands place? *(no)*

What is the value of the ten thousands place for 9,965? *(0)*

What is the value for the ten thousands place for 11,125? *(10,000)*

Is 0 ten thousands greater than or less than 1 ten thousands? *(less than)*

Write the correct place value sentence. *(9,965 is less than 11,125)*

What did Molly do wrong? *(she compared 9 thousands with 1 ten thousands, so she did not compare the correct place values with each other)*

How could Molly have avoided this mistake? *(look at the place and the value, not just the digit)*

Think of a number that is less than 9,965. Turn to your math partner and tell them the number.

Practice **Time: 8 min**

Activity 1: Students will practice comparing numbers.

Have students turn to the ***Practice Sheets*** on pages 81 and 82. Work with students, then gradually fade teacher assistance. Have students complete both pages.

Activity 2: Play ***Stay and Play!*** using a set of cards with numbers 0 to 9. 1 student will shuffle the deck of cards, then deal out 4 [or 5] cards to each student. Students will arrange their cards to create a number with the greatest value possible. Once students create their number from their cards they must declare if they are "Staying" or "Playing." If the student thinks they have a number with a greater value than other students' numbers they will say, "Play." If the student thinks their number is less than other numbers they can say, "Stay." When every student has stated if they are staying or playing, they reveal their cards and read their number to the group. The student with the greatest value of the group collects the cards from the other players that "played" that round. Any students who "stayed" keep their own cards. The student with the most cards at the end of the game wins.

Independent Practice Time: 6 min

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many items as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 14

Numbers on the Number Line

Lesson Objectives	• The student will place 4- and 5-digit numbers on the number line. • The student will use place-value language to place numbers on the number line.	
Vocabulary	**number line:** a number line is a piece or segment of a line that shows a set of numbers **interval:** distance between two points	
Reviewed Vocabulary	compare, greater than, less than	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 171-180) • Whiteboard with marker • Number cards	• Student Booklet (pp. 86-90)

Preview

Say: **Today we will write numbers on *number lines*.**

Engage Prior/Informal Knowledge — Time: 3 min

Discuss the concept of "between" with students. Have a whiteboard and number cards available.

Pick one of the following activities to review:

- Draw a number line from 5-20 that counts by 5s on the whiteboard. Have students tell which numbers come between 2 of the numbers.
- Place number cards 5, 10, 15, and 20 on the table. Discuss with students which numbers come between 2 of the numbers.

Modeled Practice — Time: 8 min

1. Work with the number line to place 3 new numbers on the number line.

   Have students use *Modeled Practice Sheet #1*. Point to the number line.

Say: **A *number line* is a piece of a longer line showing numbers in a specific range. It extends forever in both directions.**

Number lines* **show sets of numbers in** ***intervals*****. An** ***interval*** **is the distance between 2 numbers. For example, a thermometer may only show every 10 degrees, having an** ***interval*** **of 10.**

Point to the first number line.

Say: **Look at the first *number line*. What are the least and greatest numbers on this *number line*?** *(0 and 100)* **What is the *interval* or distance between each number, for this *number line*?** *(20)*

Put your pencil on 100 on the *number line*. Would 88 be before or after 100 on the *number line*? *(before)* **Why?** *(88 is less than 100)*

Draw a hash mark where you think 88 would be on this *number line*. Label it "88."

Check that students have correctly identified the location of 88 on the number line. Point to the second number line.

Say: **This *number line* has a range from 0 through 1,000. Any number between 0 and 1,000 would be on this *number line*.**

Point to the section between 0 and 1,000.

Say: **As we discussed earlier, a number is in the middle when it is between 2 numbers. Think about your day, lunch is between what 2 subjects?** *(allow a variety of answers)*

Point to before 0 and after 1,000.

Say: **A number that is before the first number in value and a number after the last number would not be represented on this *number line*.**

Would 321 be on this *number line*? *(yes)* **How do you know?** *(it is between 0 and 1,000)*

Would 4,321 be on this *number line*? *(no)* **How do you know?** *(4,324 is greater than 1,000)*

Would 500 be on this *number line*? *(yes)*

About where would 500 be on the *number line*? *(in the middle, halfway between 0 and 1,000)* **Mark 500 on the *number line*. Draw a hash mark and then label it "500." 500 is between 0 and 1,000 on this *number line*. Another way to think about 500 is that it is halfway to 1,000.**

Check that students have correctly identified the location of 500 on the number line.

Say: **Give me another number that we could write on this *number line*.** *(allow a variety of answers between 0 and 1,000)*

Have the students determine an approximate location for their number and label it on the number line. Using 500 as a reference point, ask students if their number is greater than or less than 500.

Point to the third number line.

Say: **Look at the next *number line*. What are the least and greatest numbers on this *number line*?** *(2,000 and 4,000)*

Would the number 1,032 be located on this *number line*? *(no)*

How do you know? *(1,032 is less than 2,000)*

What is the *interval* of the numbers on this *number line*? *(500)*

What 2 numbers on the *number line* would 3,200 fall between? *(3,000 and 3,500)*

Name a number on this *number line* that is between 2,000 and 2,500. *(allow a variety of answers)*

Have the students determine an approximate location for their number and label it on the number line. Using 2,000 and 2,500 as a reference point, ask students if their number is closer to 2,000 or closer to 2,500.

Have student turn to *Modeled Practice Sheet # 2.* Teacher and students complete the steps together as the lesson progresses.

Say: **Look at the *number line*. What are the least and greatest numbers on this *number line*?** *(6,000 and 9,000)* **What is the *interval*, or distance, between each number?** *(1,000)* **How do you know?** *(looked at the first number and then the second number, added 500)*

This *number line* has some boxes for missing numbers. We are going to write missing numbers to show where they would be located on the *number line*.

Point to the numbers at the top of the sheet.

Say: **Read these numbers.** *(6,873, 8,214, 6,320)*

We need to locate these 3 numbers on the *number line*. Look at the first number, 6,873. What 2 numbers on the *number line* is 6,873 between? *(6,000 and 7,000)* **How do you know?** *(because 6,873 is greater than 6,000, but less than 7,000)*

There are 2 boxes between 6,000 and 7,000 on this *number line*. Is 6,873 going to be closer to 6,000 or 7,000? *(7,000)* **How do you know?** *(accept reasonable answers that include that there are 8 hundreds, which is closer to the next thousand)*

There are 2 boxes close to 6,000. Do you think 6,873 is right next to 6,000 or closer to 7,000? *(it is closer to 7,000)* **Write "6,873" in the box that is closer to 7,000.**

Watch For	**Students may incorrectly place numbers on the number line. For example, students may guess that 6,873 is closer to 6,000 because they do not have enough reference points. Assist students by first having them label "6,500" on the number line. Then compare 6,500 to 6,873.**

Say: **We can describe 6,873 as being greater than 6,000, but less than 7,000. What is another way to describe 6,873?** *(between 6,000 and 7,000; after 6,000; accept other reasonable answers)*

What about 8,214? What 2 numbers on the *number line* is it between? *(8,000 and 9,000)* **Is it closer to 8,000, or closer to 9,000?** *(it is closer to 8,000)*

Is 8,214 greater than 8,000? *(yes)* **By a lot or by a little?** *(a little)*

Which box do you think is the best location for 8,214? *(first box after 8,000)* **Write "8,214" in the box on the *number line*.**

We can describe 8,214 as being greater than 8,000, but less than 9,000. What is another way to describe 8,214? *(it is less than 9,000; greater than 6,000; accept other reasonable answers)*

What is the last number we need to place on the *number line*? *(6,320)*

Think about which 2 numbers 6,320 falls between. Write "6,320" in the correct box on the *number line*.

Allow 5-7 seconds for students to write "6,320" in the first box. Provide immediate correctly feedback in necessary.

Say: **How did you know where to write "6,320"?** *(it is closer to 6,000; greater than 6,000, but less than 7,000 and 8,000)*

Practice **Time: 8 min**

Activity 1: Students will continue to work on *Modeled Practice Sheet #2.*

Say: **There are 2 more boxes on your sheet. Work with your math partner to decide what would be a reasonable guess for the number that would be in that box. Be ready to share with the group why you choose the numbers you did.**

Allow time for students to write 2 numbers in the empty boxes. Ask follow up questions such as:

- What is halfway between 7,000 and 8,000? *(7,500)* Is your number greater than or less than 7,500? *(less than)*
- What is halfway between 8,000 and 9,000? *(8,500)* Is your number greater than or less than 8,500? *(greater than)*
- Is your number closer to 8,000 or 9,000? *(closer to 9,000)* How do you know? *(accept answers that include that the hundreds place is greater than 5 hundreds)*
- Is your number closer to 7,000 or 8,000? *(closer to 7,000)* How do you know? *(accept answers that include that the hundreds place is less than 5 hundreds)*
- What would be the next number after your number? *(example answer: if a student wrote 7,200, the next number would be 7,201)*

Activity 2: Students will practice placing numbers on the number line

Have students turn to the *Practice Sheet* on page 88. Work with students, and then gradually fade teacher assistance. Check for understanding of working on the number line using the following questions:

- How do you determine the location of each of the numbers on the number line? *(answers vary; look for answers about the number being greater than or less than another number)*
- Which place in the number do you look at to compare the number with the numbers on the number line? *(first line, the tens place; second line, the hundreds place)*
- What is the interval of the number line? *(first line, 50; second line, 100)*

Independent Practice Time: 6 min

1. For 5 minutes: Have students turn to the *Independent Practice Sheets* and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many items as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 15

Ordering Numbers on the Number Line

<table>
<tr><td>Lesson Objectives</td><td colspan="2">• The student will place and order numbers on the number line.
• The student will use place-value language to place and order numbers on the number line.</td></tr>
<tr><td>Vocabulary</td><td colspan="2">No new words are introduced.</td></tr>
<tr><td>Reviewed Vocabulary</td><td colspan="2">compare, greater than, interval, less than, number line, order, range</td></tr>
<tr><td rowspan="2">Instructional Materials</td><td>Teacher</td><td>Student</td></tr>
<tr><td>• Teacher Masters (pp. 181-196)
• Whiteboard with marker
• Place the Number! materials: game sheets, number list, sheet protectors, markers</td><td>• Student Booklet (pp. 91-98)</td></tr>
</table>

Preview

Say: **Today we will use the number line to order 3- and 4-digit numbers from least to greatest and greatest to least.**

Engage Prior/Informal Knowledge — Time: 3 min

Have students turn to the ***Engaged Practice Sheet*** to review writing numbers on the number line.

Ask questions such as:

- What is the range for the number line? *(first line: 2,415 to 2,425; second line: 1,000 to 3,000)*
- Which place did you use to compare the two numbers to help place them on the number line? *(first set: the tens place; second set: the hundreds place)*
- Why do you think the number goes in the box? *(accept answers that include justification using greater than and less than references)*

Have students think of a number to write in the extra box on each line. Students will then share their number and explain why it is a reasonable guess for that location of the number line. Possible answers for the first line include 2,420 and 2,421. Possible answers for the second line include 1,720 and 1,725

Modeled Practice — Time: 8 min

1. Order 4-digit numbers from least to greatest on the number line. Then students will write the numbers from greatest to least.

   Have students turn to ***Modeled Practice Sheet #1*** and point to the 3 numbers. Teacher and students complete the steps as the lesson progresses.

Say: **I have 3 numbers to compare. What are the numbers?** *(4,711; 4,683; 5,735)*

I am going to place these numbers on the number line. This number line does not have boxes, so we will make a good guess at where the numbers go.

Point to the number line.

Say: **What is the range on this number line?** *(4,500 to 6,500)*

Which number is the greatest on this number line? *(6,500)*

Which number is the least? *(4,500)*

Point to 4,500 and 6,500 on the number line.

Say: **The first number on a number line is always less than the last number, or the greatest number.**

First we need to compare the 3 numbers. What place do we start in when comparing numbers? *(the greatest place, thousands)* **Look at the digit in the thousands place for the 3 numbers. Which number is the greatest?** *(5,735)*

How do you know that 5,735 is the greatest of these 3 numbers? *(5,735 has 1 more group of 1,000 than the other 2 numbers)*

5,735 is greater than 4,711 and 4,683.

Point to 4,500 and 6,500 on the number line.

Say: **Is 5,735 closer to 4,500 or 6,500?** *(6,500)*

How do you know that 5,735 is closer to 6,500? *(5 groups of 1,000 and 7 groups of 100 are closer to 6 groups of 1,000 than 4 groups of 1,000)*

Place your finger on the number line where you think we should write "5,735."

Check students' placement of their fingers before having them draw a hash mark and labeling it "5,735." Then point to 4,711 and 4,683.

Say: **Out of the 3 numbers we compared, which is the greatest?** *(5,735)* **What is another way to describe this number?** *(5,735 is the greatest number of the 3 numbers; 5,735 is less than 6,500; accept other reasonable explanations)*

Now look at the next 2 numbers. How many groups of 1,000 are in the 2 numbers? *(4 and 4)* **Will this help us identify the greatest number?** *(no)*

They both have 4 groups of 1,000, so this will not help us place them on the number line. What is the next place we should compare? *(hundreds)* **Why?** *(it is the next greatest place)* **Look at the hundreds. How many groups of 100 are in the hundreds place?** *(6 and 7)*

Point to 4,500 on the number line.

Say: **Which is closer to 4,500, 6 groups of 100 in 4,683 or the 7 groups of 100 in 4,711?** *(closer to 6 groups of 100 in 4,683)*

Place your finger on the number line where we should write "4,683."

Check students' placement of their fingers before having them draw a hash mark and labeling it "4,683."

Say: **How can we describe this number?** *(4,683 is greater than 4,500, but less than 5,735; accept other reasonable answers)*

Where do we write "4,711"? *(between 4,683 and 5,735)*

Is 4,711 closer to 4,683 or 5,735? *(closer to 4,683)* **How do you know?** *(4,700 is closer to 4,600 than 5,700)*

Place your finger on the number line where we should write "4,711."

Check students' placement of their fingers before having them draw a hash mark and labeling it "4,711."

Say: **How can we describe this number?** *(allow a variety of answers, such as greater than 4,500; between 4,500 and 6,500; between 4,683 and 5,735)*

By writing these numbers on the number line, we ordered the 3 numbers from least to greatest. We can use this knowledge to write these 3 numbers' order from greatest to least.

Point to the 3 empty lines below the number line.

Say: **We want to order these 3 numbers from greatest to least. What number is the greatest?** *(5,735)*

Write "5,735" on the first line.

Say: **What number is less than the others, or least in value?** *(4,683)*

Write "4,683" on the last line.

Say: **What number is between 5,735 and 4,683?** *(4,711)*

Write "4,711" on the line between the greatest and the least number.

Say: **Read with me the numbers from greatest to least: "4,683, 4,711, 5,735."**

Which number is greater, 5,735 or 4,711? *(5,735)*

Which number is least, 5,735 or 6,500? *(5,735)*

2. Order 3- and 4-digit numbers from least to greatest on the number line. Students will then write the numbers from least to greatest.

Have students turn to ***Modeled Practice Sheet #2*** and point to the 3 numbers. Teacher and students complete the steps as the lesson progresses.

Say: **Read the numbers.** *(1,918; 981; 1,940)*

Point to the number line.

Say: **Look at the number line. What is the range?** *(900 to 2,000)*

What are the next 2 numbers after 900 that are shown on this number line? *(1,000 and 1,100)*

What is the interval, or distance, between these first 3 numbers? *(100)*

First, we will write the numbers on the number line and then order the 3 numbers from least to greatest.

Point to the numbers at the top of the page.

Say: **Which number is the closest to 2,000?** *(1,940)*

How do you know? *(it is in the thousands place; has more tens than 1,918)*

Place your finger on the number line where we should write "1,940."

Check students' placement of their fingers before having them draw a hash mark and labeling it "1,940."

Say: **We have 2 more numbers to place on the number line. What numbers?** *(1,918 and 981)* **Which number is greatest?** *(1,918)*

Point to 1,940 on the number line.

Say: **Look at the intervals on the number line. Where should we place 1,918? How can we describe 1,918?** *(less than 1,940; greater than 900; between 1,000 and 1,940; allow other reasonable answers)*

Have students draw a hash mark and label it "1,918."

Say: **Look at the last number. What 2 numbers on the number line would 981 fall between?** *(900 and 1,000)*

Is 981 closer to 900 or closer to 1,000? *(1,000)*

Have students make a hash mark where 981 should be placed on the number line and label it.

Say: **The numbers on the number line are in order from least to greatest. Now write the numbers in order from least to greatest.**

Allow students time to write the numbers from least to greatest.

Say: **Read the numbers with me from least to greatest: "981, 1,918, 1,940."**

3. Work with a non-example of ordering numbers in the wrong direction.

Have students turn to ***Modeled Practice Sheet #3***. Teacher and students complete the steps as the lesson progresses.

Say: **Read the problem together. Ready? Read: "Devon ordered the 3 numbers below in order from greatest to least. Use a number line to see if he is correct."**

Point to the numbers in the middle of the page.

Say: **What are Devon's numbers?** *(2,570; 2,648; 2,600)*

Draw a number line. What should be the range, or the lowest and highest numbers, on the number line? *(2,000 to 3,000)* **Why?** *(the numbers are in the 2,000s, but are not greater than 3,000)*

To help us place the numbers, what is halfway between 2,000 and 3,000? *(2,500)*

Place the 3 numbers on the number line.

Allow 10-15 seconds for students to place the numbers on the number line. Provide corrective feedback when necessary.

Say: **Did he put the numbers in the correct order?** *(no)*

How could he have avoided this mistake? *(use a number line to help order the numbers; accept other reasonable answers)*

What is the order the numbers should have been written in? *(2,648, 2,600, 2,570)* **Write the numbers in order at the bottom of your page.**

Watch For

Students may forget which order to write the numbers in.
For example, students often have difficulty knowing whether to write numbers from least to greatest or greatest to least.
Instruct the student to write a big "G" arrow and then "L" arrow to remember the way to order the numbers.

Practice **Time: 8 min**

Activity 1: Students will practice the concepts of writing numbers on the number line and ordering numbers.

Have students turn to the ***Practice Sheets*** on pages 95 and 96. Have students work with a math partner for items #1-4.

Have the group work together for items #5 and 6. Students should read the problem out loud and then discuss how to use the number line to help order the numbers. Have students use problem-solving skills to order the number of pages each friend read in greatest to least order.

Activity 2: Students will practice concepts while playing the ***Place the Number!*** game.

Teacher Note

Ahead of time, write the following numbers on a piece of paper to have students use with the number lines:

Number line #1: 3,829; 5,600; 4,000; 3,731; 5,711; 4,325

Number line #2: 2,001; 870; 1,001; 822; 1,989; 992

Number line #3: 7,777; 8,301; 8,555; 7,626; 8,600; 7,999

Students will work in pairs to play the game. Each pair will work with a number line in a plastic sleeve or laminated (to allow for multiple uses) a list of numbers, and a marker. Each student will take a number from the list, find the number's place on the number line, and write the number on the number line. The student will explain to their partner why the number is placed in that position on the number line. As time permits, write a number that is *not* in the number range and ask students where the number should be placed on the number line.

Independent Practice Time: 6 min

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many items as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

ESTAR INTERVENTION

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 16

Ordering 4-Digit Numbers

Lesson Objectives	• The student will order 4-digit numbers. • The student will use place-value language to order numbers.	
Vocabulary	**No new words are introduced.**	
Reviewed Vocabulary	compare, greatest, least, order	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 197-210) • Whiteboard with markers • *Make the Order!* cards	• Student Booklet (pp. 99-105)

Preview

Say: **We will order 4-digit numbers from least to greatest and greatest to least.**

Engage Prior/Informal Knowledge — Time: 3 min

Review numbers on the number line.

Have students turn to the ***Engaged Practice Sheet***. Use the number line on the page to answer the questions. Discuss each question with the students and complete the sheet together as a group.

Modeled Practice — Time: 8 min

1. Order 4-digit numbers from least to greatest without the use of the number line.

   Have students turn to ***Modeled Practice Sheet #1***. Teacher and students complete the steps as the lesson progresses.

Say: **We have used the place-value chart and the number line to help order numbers. Today we will practice ordering numbers without these tools.**

Read the numbers. *(3,989; 3,099; 2,999)*

We need to order these numbers from least to greatest. What does that mean? *(the number with the least value will be first in the order)*

What place do we look at first when comparing numbers? *(the greatest place)*

What is the greatest place in these 3 numbers? *(thousands place)*

Is the value of the thousands place the same or different in these 3 numbers? *(different)* **What is the value in the thousands place in these 3 numbers?** *(3,000; 3,000; 2,000)*

Which number has a different value in the thousands place than the other two numbers? *(2,999)*

What is the value of the thousands place in 2,999? *(2,000)*

Is this greater or less than the other numbers? *(less than)* **How do you know?** *(the other numbers have a value of 3,000 in the thousands place)*

Which number is the least? *(2,999)* **Write "2,999" on the first blank.**

Teacher Note

Teachers may suggest different scaffolds that may already be used in the classroom.

For example:

- Crossing out numbers in the list once placed in the ordered list.
- Circling or highlighting the place that is being compared.

Say: **What numbers are left to order?** *(3,989 and 3,099)*

These 2 numbers have the same value for the thousands place. How do we compare them? *(look at the next greatest value)* **What is the next greatest value?** *(the hundreds place)*

Is the value in the hundreds place the same or different? *(different)*

How is the value in the hundreds place different? *(3,989 has a value of 900 in the hundreds place and 3,099 has a value of 0 in the hundreds place)*

Is 3,989 greater than or less than 3,099? *(greater than)*

Which number is the greatest? *(3,989)* **Where do you write "3,989" in the order from least to greatest?** *(in the last place or the greatest place)*

Where would 3,099 go in this order from least to greatest? *(between 2,999 and 3,989)*

How do you know? *(3,099 is greater than 2,999 because it has 3,000 in the thousands place, and it is less than 3,989 because it has 900 in the hundreds place)* **Write "3,099" between 2,999 and 3,989 on the line.**

If I placed all 3 numbers on the number line, would 3,099 be closer to 2,999 or to 3,989? *(2,999)*

How do you know? *(3,099 has 0 in the hundreds place, which means it is close to 3,000, or 1 more than 2,999)*

Read the numbers with me: "2,999, 3,099, 3,989."

In what order did we write these numbers? *(from least to greatest)*

Write "3,000" under the ordered numbers at the bottom of the page.

Say: **Where would I add 3,000 to this number order?** *(between 2,999 and 3,099)*

How do you know? *(3,000 is greater than 2,999 but less than 3,099)*

2. Order 4-digit numbers from greatest to least.

Have students turn to ***Modeled Practice Sheet #2.***

Say: **Read the problem together. Ready? Read: "The event center held 4 different events last month. The first event was a rock concert. The event center sold 5,909 tickets to the concert. The next event was the circus, which sold 4,678 tickets. The following week the city basketball team had a game and sold 8,249 tickets. At the end of the month a magic and illusions show came to town and sold 5,312 tickets. List the events in**

order from the greatest number of tickets sold to the least number of tickets sold."

What is the question asking you to do? *(list the numbers in order from greatest to least)*

What numbers? *(5,909; 4,678; 8,249; 5,312)* **Underline or circle the numbers.**

This time we will order the numbers from greatest to least. What does this mean? *(the number with the greatest value will be first in order)*

What do we do first? *(find the greatest place where the values are different)*

What is the greatest place where the values are different? *(thousands place)*

Which number has the greatest value in the thousands place? *(8,249)* **What is the value of the thousands place in 8,249?** *(8,000)*

How do you know? *(8,000 in the thousands place for 8,249 is greater than 5,000 in the thousands place for 5,909 and 5,312 or 4,000 in the thousands place for 4,678)*

8,249 is the greatest number in this list of numbers. In which position in the order should we write "8,249"? *(the first position)* **Write it on the first blank line.**

Which number has the least value in the thousands place? *(4,678)*

How do you know? *(4,000 in the thousands place for 4,678 is less than 5,000 in the thousands place for 5,909 and 5,312 or 8,000 in the thousands place for 8,249)*

In which position in the order should we write "4,678"? *(the fourth position, or the last position, in the list)* **Write it.**

I have 2 numbers that are between the greatest number and the least number. Of the 2 numbers, 5,909 and 5,312, which is the greatest? *(5,909)*

How do you know? *(5,909 is greater than 5,312 with 6 more groups of 100; 9 hundreds is greater than 3 hundreds)* **Write "5,909" on the second blank.**

Where in the order of the number should 5,312 be written? *(between 5,909 and 4,678)*

How do you know? *(5,312 is greater than 4,678, but less than 5,909)* **Write "5,312" between 5,909 and 4,678 on the third blank.**

Read the numbers from greatest to least with me: "8,249, 5,909, 5,312, 4,678."

What event sold the most tickets? *(the basketball game)*

With the numbers in order, I can say that more tickets were sold for the rock concert than for the circus. What else could I say about the number of tickets sold for the rock concert? *(less tickets were sold for the magic show than the rock concert; accept other reasonable answers)*

Watch For	Students may have difficulty ordering more than 3 numbers correctly. For example, students may place 5,909 first in the previous problem because they are ordering by the hundreds place instead of the thousands place. Assist students in their thinking by asking questions about place value for the order of the numbers, such as: • How did you tackle similar problems? • Would it help to create a diagram? A picture? To use a number line?

Practice Time: 8 min

Activity 1: Students will practice ordering numbers from least to greatest and greatest to least.

Have students turn to the *Practice Sheets* on pages 102 and 103. Work with students for items #1-5.

After item #2,

Say: **Where would I place the number 8,800 in this order?** *(between 8,922 and 8,721)*

Check for understanding of ordering numbers using the following questions:

Say: **What is the greatest number?** *(answers vary; look for answers about the number with the greatest value in the greatest place)*

What is the least number? *(answers vary; look for answers about the number with the least value)*

What number goes between the greatest number and the least number? *(answers vary)*

How do you know? *(look for answers about place value)*

Gradually fade teacher assistance. Complete both pages.

Activity 2: Students will practice concepts while playing the ***Make the Order!*** game.

Students will work as a group to play the game. Place the stack of cards in the middle. Pick one card and place it in the middle of the table to begin the game. The first student picks a card from the stack, decides if the numbers are going to be ordered greatest to least or least to greatest, and places his/her card appropriately to the right or left of the first card. Each student takes a turn picking a number card and placing it in the number order. After each student has placed a card in the number order, the group reads the numbers and checks that each card was placed appropriately.

During the game, ask such questions as:

- Which number is the greatest number or the least number? How do you know? *(look for understanding of magnitude of numbers)*
- What is the value of the __ in the thousands place, hundreds place, tens place, or ones place? *(look for understanding of place value)*
- Is ___ greater than or less than ___? *(look for understanding of place value and magnitude of numbers)*

Independent Practice — Time: 6 min

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many items as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

ESTAR INTERVENTION

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 17

Comparing and Ordering Multi-Digit Numbers

Lesson Objectives	• The student will compare and order multi-digit numbers and use symbols for greater than and less than. • The student will use language to compare numbers and replace the language with a symbol.	
Vocabulary	**No new vocabulary words are introduced.**	
Reviewed Vocabulary	compare, greater than, less than, order	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 211-222) • Whiteboard with marker • *Which Symbol?* cards	• Student Booklet (pp. 106-111) • Whiteboards with marker (1 per student)

Preview

Say: **Today we will compare numbers using the greater-than and less-than symbols and order numbers from least to greatest or greatest to least.**

Engage Prior/Informal Knowledge **Time: 3 min**

Students will practice writing numbers up to the hundred thousands.

Give each student a whiteboard and marker.

Say: **I will read numbers to you. You will write the numbers on your whiteboard. If the highest place in the number I read is thousand, how many digits will you write?** *(4)* **How many digits if the number I read is in the hundred thousands?** *(6)*

Read the following numbers to the students. Pause between each number to allow students time to write.

7,932 14,085 256,199 1,803

After students have written the numbers, show them the correct answers with your copy of the ***Engaged Practice Sheet***. Discuss mistakes and provide corrective feedback when necessary.

Modeled Practice **Time: 8 min**

1. Compare 2 numbers using the place-value chart.

Have students turn to ***Modeled Practice Sheet #1***. Point to the 2 numbers.

Say: **What are the numbers?** *(3,615 and 3,625)*

We will compare the numbers using the place-value chart. First, write the numbers in the place-value chart.

What is the highest place in each number? *(the thousands place)*

What is the highest place in the chart? *(the hundred thousands place)*

Will we write a digit in every column? *(no)* **Why not?** *(because the numbers do not have a value in the ten thousands or hundred thousands place)*

Write "3,615" and "3,625" in the place-value chart.

Looking at the place values for the 2 numbers, what is the first place value in which the numbers are different? *(the tens place)*

What is the value of the tens place in 3,615? *(10)* **What is the value of the tens place in 3,625?** *(20)*

Is 3,615 greater than or less than 3,625? *(less than)*

What symbol represents less than? *(<)* **Write it in the circle.**

Read the number sentence with me: "3,615 is less than 3,625."

2. Compare 2 numbers with differing number of digits using the place-value chart.

Point to the second set of numbers on the ***Modeled Practice Sheet #1***.

Say: **What are the numbers?** *(12,053 and 978)*

What is the value of the 1 in 12,053? *(10,000)* **Which column will we write the first digit?** *(the ten thousands column)* **Write it.**

What is the value of the 9 in 978? *(900)* **Which column will we write the first digit?** *(the hundreds column)* **Write it.**

How do I start to compare the numbers? *(look for the largest place where the numbers are different)*

What is the first place value where the numbers are different? *(the ten thousands place)*

Which number is greater? *(12,053)* **How do you know?** *(1 group of 10,000 compared to 0 groups of 10,000)*

Explain why 12,053 is greater than 978 when the first digit in 12,053 is less than the first digit in 978? *(the value of the first digits are 10,000 and 900; 10,000 is greater than 900)*

Draw the symbol for greater than in the circle.

Read the number sentence with me: "12,053 is greater than 978."

3. Order 3 numbers with differing number of digits using the place-value chart.

Have students turn to ***Modeled Practice Sheet #2***.

Say: **Read the problem together. Ready? Read: "Raul used the place-value chart below to order the 3 numbers in least to greatest order. His teacher told him he was incorrect. Help Raul find him mistake and fix it.**

What are Raul's numbers? *(146,962; 9,462; 4,964)*

Look at Raul's work, what mistake do you think he made? *(he did not write the digits in the correct columns in the place-value chart)*

Which numbers are incorrectly written? *(9,462 and 4,964)*

How do we fix it? *(rewrite the numbers with the first digit in the thousands place, leave the hundred thousand and ten thousand columns blank)* **Rewrite the numbers correctly in the empty place-value chart below.**

Check students' work to make sure that the numbers are written correctly in the chart. Provide immediate corrective feedback when necessary.

Say: **Raul was supposed to order the numbers in what order?** *(least to greatest)*

With the numbers written correctly in the chart, which number is the least? *(4,964)* **How do you know?** *(it has 0 in the hundred thousands place compared to 1 in the hundred thousands place, and 4 in the thousands place compared to 9 in the thousands place)*

Which number is the greatest? *(146,962)* **How do you know?** *(it is the only number with a group of 100,000)* **Write the 3 numbers in least to greatest order on the line below.**

Read the correct order of the numbers. *(4,964; 9,462; 146,962)*

Practice — Time: 8 min

Activity 1: Students will practice concepts using greater than or less than symbols.

Have students turn to the *Practice Sheets* on pages 108 and 109. Students may work with a math partner to complete the pages.

Check for understanding of comparison and symbol usage using the following questions:

Say: **How do you know whether the number is greater than or less than?** *(look for answers about place value)*

How do you know which symbol to use? *(look for knowledge of symbols)*

What does the symbol represent? *(look for correct usage of the symbols)*

Gradually fade teacher assistance. Complete both pages.

Activity 2: Students will practice concepts while playing the *What Symbol?* game.

Students will work in pairs to play the game. Distribute the number and symbol cards from *What Symbol?*. Each student will pick a number card to place on the table. 1 student will pick a symbol card (<, >, =) to place between the numbers. The other student will read the sentence. Change the placement of the number cards. Ask if the sentence is still correct, and if not, what is needed to make the sentence correct.

During the game, ask such questions as:

- What is the value of the __ in the thousands place, hundreds place, tens place, or ones place? *(look for understanding of place value)*

- Is ___ greater than or less than ___? *(look for understanding of place value and magnitude of numbers)*
- Which symbol do you use to show greater than or less than? *(look for correct usage of symbols)*

Independent Practice — Time: 6 min

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many items as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

ESTAR INTERVENTION

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 18

Comparing and Ordering Whole Numbers

Lesson Objectives	• The student will compare and order multi-digit numbers and use symbols for greater than and less than. • The student will use corresponding mathematical language and symbols when comparing 2 numbers.	
Vocabulary	**No new words are introduced.**	
Reviewed Vocabulary	compare, greater than, less than, period, thousands	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 223-236) • Whiteboard with marker • Number cards with digits from 0-9	• Student Booklet (pp112-118) • Whiteboard with marker (1 per student)

Preview

Say: **Today we will compare numbers using the greater than and less than symbols and order numbers from least to greatest or greatest to least.**

Engage Prior/Informal Knowledge Time: 3 min

Have students review writing numbers in expanded form. Distribute a whiteboard with marker to each student. On the teacher whiteboard, write the following numbers 1 number at a time in standard form. Have the students write the number in expanded form. Erase and repeat with the next number.

- 58,931 *(50,000 + 8,000 + 900 + 30 + 1)*
- 7,084 *(7,000 + 80 + 4)*
- 103,803 *(100,000 + 3,000 + 800 + 3)*
- 60,014 *(60,000 + 10 + 4)*

Ask questions such as:

- Why do you not write the value for the place with a 0? *(because there are 0 groups in that place)*
- What is the value in the [hundreds thousands, ten thousands, thousands, hundreds, tens, ones] place? *(answers will vary depending on the number and place in question)*
- Why are the number of digits in the number and the number of values in the expanded form sometimes different? *(because when there is a 0 in a place, the value is 0 groups so you do not write it in expanded form)*

Modeled Practice **Time: 8 min**

1. Compare 2 multi-digit numbers without the use of the place-value chart.

   Have students turn to ***Modeled Practice Sheet #1***. The teacher and students will complete the steps together as the lesson progresses.

Say: **We have 2 numbers to compare. What numbers?** *(5,781 and 981)*

How many digits are in the first number? *(4)* **How many are in the second number?** *(3)* **Do the numbers have the same number of digits?** *(no)*

What do we already know when we are comparing 2 numbers with different numbers of digits? *(the number with more digits is the greater number)* **Why?** *(if a number has more digits it is in a greater place value)*

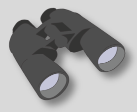
5,781 has a digit in the thousands place. What digit is in the thousands place? *(5)* **What is the value of the 5?** *(5,000)*

981 has a digit in the hundreds place. What digit is in the hundreds place? *(9)* **What is the value of the 9?** *(900)*

Which is greater: 5,000 or 900? *(5,000)*

Which symbol will you write in the circle to make the statement true? *(>, greater than symbol)* **Write it.**

Check that students have written the correct symbol in the circle. Provide immediate corrective feedback when necessary.

Watch For 	**Students may have difficulties with the symbols. For example, students may know that the first number is greater than or less than the second number, but confuse the symbol or symbol names.** **Instruct students to read the comparison sentence before having them change an incorrect symbol.** **If the student uses the correct language but the incorrect symbol, correct the symbol use.**

Say: **Read the comparison sentence.** *(5,781 is greater than 981)*

On the 2 blank lines at the bottom of your sheet, write your own comparison sentence using 2 numbers with different numbers of digits.

Wait 10-15 seconds for students to write a comparison sentence.

Say: **Switch papers with your math partner.**

Look at your partner's comparison sentence. Is it true? *(yes or no)* **How do you know?** *(allow students to explain their partner's work)*

2. Order 3 multi-digit numbers without the use of a place-value chart.

Have students turn to ***Modeled Practice Sheet #2*** and point to the 3 numbers. The teacher and students will complete the steps together as the lesson progresses.

Say: **We will write these 3 numbers in order from greatest to least. What are the numbers?** *(842, 48,240, and 4,820)*

What is the greatest place in 842? *(the hundreds)*

What is the greatest place in 48,240? *(the ten thousands)*

What is the greatest place in 4,820? *(the thousands)*

Do these numbers have the same number of digits? *(no)*

Which number has the greatest value? *(48,240)*

How do you know? *(it has the most digits; it has a value in the ten thousands place when the other numbers only have values in the thousands and hundreds place)*

To write these 3 numbers in order from greatest to least, we will write "48,240" in the first blank. Write it.

Which number will go next in the order? *(4,820)* **Why?** *(because it has a value in the thousands and the other number does not)* **Write it.**

What number is least? *(842)* **Why?** *(it only has a value in the hundreds)*

Read the numbers in order from greatest to least. *(48,240, 4,820, and 842)*

3. Compare and order 3 multi-digit numbers close in value.

   Have students turn to ***Modeled Practice Sheet #3***. The teacher and students will complete the steps together as the lesson progresses.

Say: **Read the problem together. Ready? Read: "On the semi-finals episode of the singing talent show, the top three singers competed for the most votes to move on to the finals. In the table below are the singers and the number of votes they received. Only the top two will move on to the finals. Which two will move on?**

Read the information in the table. What is listed in the first column? *(name of the singers or contestants)*

What is listed in the second column? *(the number of votes)*

What do we need to figure out in order to answer this question? *(who received the most or the least number of votes)*

How should we solve this problem? *(order the number of votes from greatest to least or least to greatest)*

How many votes did Andrew Goodfellow receive? *(118,596)*

How many votes did Zoe Moon receive? *(118,992)*

How many votes did Martin LaFeit receive? *(118,594)*

Does each number have the same number of digits? *(yes)*

How many digits? *(6)*

Look in the thousands period for all 3 numbers. Are any of the values in the thousands period different? *(no)*

Look in the units period for all 3 numbers. What is the greatest place in the 3 numbers where the value is different? *(the hundreds place)*

Which number has the greatest value in the hundreds place? *(118,992)*

Which contestant received 118,992 votes? *(Zoe Moon)*

Write this number first on the line below. Will Zoe be a finalist in the singing talent show? *(yes)* **Write her name in one of the finalists' blanks.**

The contestants left to be compared have 118,596 votes and 118,594 votes. Comparing these 2 numbers, what is the greatest place in which these numbers are different? *(the ones place)*

Which number is greater? *(118,596)*

How much is 118,596 greater than 118,594? *(by 2)*

Write the last 2 numbers in order.

Which contestant received 118,596 votes? *(Andrew Goodfellow)* **Write his name in the other finalist blank.**

Who will not be moving on to the final round? *(Martin LaFeit)*

Practice — Time: 8 min

Activity 1: Students will practice concepts using greater than or less than symbols.

Have students turn to the *Practice Sheets* on pages 115 and 116. Students may work with a math partner to answer questions. Gradually fade teacher assistance. Students will complete both pages.

Activity 2: Students will build and compose 6-digit numbers while playing *Stay or Play.*

Play *Stay or Play* using a set of cards with numbers 0 to 9. 1 student will shuffle the deck of cards, then deal out 6 cards to each student. Students will arrange their cards to create a number with the greatest value possible. Once students create a number from their cards, they must declare if they are "Staying" or "Playing." If the student thinks they have a number with a greater value than other students' numbers they will say, "Play." If the student thinks their number is less than other numbers they can say, "Stay." When every student has stated if they are staying or playing, they reveal their cards and read their number to the group. The student with the greatest value of the group collects the cards from the other players that "played" that round. Any students who "stayed" keep their own cards for the next round. The student with the most cards at the end of the game wins.

Independent Practice — Time: 6 min

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many items as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

ESTAR INTERVENTION

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 19

Comparing and Ordering Multi-Digit Numbers

Lesson Objectives	• The student will compare and order multi-digit numbers. • The student will use place-value language to order numbers.	
Vocabulary	**No new words are introduced.**	
Reviewed Vocabulary	compare, digits, greatest, least, order	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 237-252) • *In Between* 4-digit number cards	• Student Booklet (pp. 119-126) • Whiteboard with marker

Preview

Say: **Today we will compare numbers and place them in order.**

Engage Prior/Informal Knowledge — Time: 3 min

Review locating numbers on the number line. Have students turn to the *Engaged Practice Sheet*. Work together to complete the questions.

Say: **First, we will review locating numbers on the number line. This skill helps us build a mental picture of how numbers are related to each other.**

Look at your sheet. What are the numbers we must locate on the number line? *(8,829 and 6,747)*

What are your first observations about these numbers? *(both are in the thousands; 8,829 is greater than 6,747; both have 4 digits; accept other reasonable answers)*

What is the range of the number line? *(5,000 to 10,000)*

Is 8,829 closer to 5,000 or 10,000? *(10,000)* **Write it. Looking at the 3 empty boxes on the number line, would 8,829 go in the first, middle, or last box?** *(last)* **Write it.**

Is 6,747 closer to 5,000 or 10,000? *(5,000)* **Write it. Looking at the 2 empty boxes on the number line, would 6,747 be in the first box, closer to 5,000, or the middle box, closer to 8,829?** *(first box)* **Why?** *(it is less than 2,000 away from 5,000 but more than 2,000 away from 8,829)*

What would be a reasonable estimation for the number in the middle box? *(accept answers between 6,900 to 8,400)*

Modeled Practice

Time: 8 min

1. Write 4-digit numbers in order from least to greatest. Choose a number that would fit in the sequence.

   Have students turn to ***Modeled Practice Sheet #1***. The teacher and students should complete the steps as the lesson progresses.

Say: **Read the numbers.** *(5,089; 5,463; 5,419; 5,035)*

Are these numbers in order from least to greatest? *(no)*

Have students write the numbers in order from least to greatest. Read the numbers again as a group, this time in order.

Say: **What is the range, the least and the greatest numbers, of the list of ordered numbers?** *(5,035 and 5,463)*

Look at the list of numbers at the bottom of the page. Read the numbers. *(5,496; 5,360; 4,019)*

Which 1 of these numbers would be in the range of the ordered numbers? *(5,360)* **How do you know?** *(accept reasonable explanations that include comparing the numbers)*

Where would it go in the sequence from least to greatest? *(between 5,089 and 5,419)* **How do you know?** *(5,360 is greater than 5,089, but less than 5,419)*

What is another number that would be in the range of the ordered numbers? *(accept any number between 5,035 and 5,463)* **Write it.**

2. Order 4-digit numbers from a table.

   Use ***Modeled Practice Sheet #2***. The teacher and students should complete the steps as the lesson progresses.

Say: **The table shows the number of people who attended a festival on each of the 3 days. We will use this table to answer the questions that follow.**

First, what does this table tell us? *(the number of people who attended a festival)*

Which days did the festival take place? *(Friday, Saturday, and Sunday)*

How many people attended the festival each day? *(Friday there were 2,987, Saturday there were 3,587, and Sunday there were 3,512)*

Read the first question. *(Which day had the best attendance?)*

When looking for the day with the best attendance, are you looking for the greatest number or least number? *(greatest number)* **Which day is it?** *(Saturday)* **Write it.**

Read the second question. *(Which day was the least attended?)* **Which day is it?** *(Friday)* **Why?** *(because 2,987 is less than 3,512)*

What is the next question? *(How many more people attended Saturday than Friday?)*

To solve this problem we need to know how many people attended each day. Write down the number of people who attended Friday and Saturday. *(2,987 and 3,587)*

Comparing the 2 numbers, which places have different digits? *(the thousands and the hundreds)*

I am going to round the numbers to make it easier to compare. 2,987 is close to 3,000 and 3,587 is close to 3,600.

How many more hundreds from 3,000 to 3,600? *(6 more hundreds)*

About how many more people attended Saturday than Friday? *(600)*

Is Sunday's attendance closer to Friday's or Saturday's? *(Saturday's)* **Write it.**

How close is it? Is it more or less than 100? *(less than 100)* **Work with your math partner to find how close the numbers are to each another.**

Allow students to quietly work to find the difference. Have students share their answer and explain how they found it.

3. Use a non-example to order numbers.

Use *Modeled Practice Sheet #3*. The teacher and students should complete the steps as the lesson progresses.

Say: **Ming made a mistake in his work. We will read the problem together to help him fix it.**

Ready? Read: "Ming played a video game every day for a week. He emailed his 3 top scores to a friend. In the table below are his scores for the week."

Ming emailed his friend that his top 3 scores were 2,989, 2,899, and 891. What mistake did Ming make?

What is the question asking us to find? *(the mistake Ming made when finding his 3 top scores)*

Look at the table. What is listed in the left column? *(the days of the week)*

What is listed in the right column? *(Ming's scores)*

Which day do you think was his best score? *(Monday)* **Why?** *(2,989 is the greatest number; it is the only number with 2 groups of 1,000 and 9 groups of 100)*

How many other days did he score greater than 2,000? *(2 other days, Wednesday and Sunday)*

What day did he score his lowest score? *(Friday)* **Why is this the lowest score?** *(because there are 0 groups of a thousand)*

Why do you think Ming wrote 891 as 1of his top scores? *(he might have thought the 8 was 8,000, instead of 800; he looked at* *the digit, but not the value and 8 is larger than 2 or 1; accept other reasonable answers)*

What are the 3 top scores Ming should have emailed to his friend? *(2,989; 2,899; 2,789)*

How much greater was his score on Monday than on Sunday? *(200)* **How do you know?** *(the only place different is the hundreds, it is 2 more groups of 100)*

Practice **Time: 8 min**

Activity 1: Students will practice ordering numbers from least to greatest and greatest to least.

Have students turn to the ***Practice Sheets*** on pages 123 and 124. Gradually fade teacher assistance. Students may work with a math partner to complete both pages.

Say: **Work with your math partner to complete the sheets.**

Activity 2: Students will practice concepts while playing the *In Between* game.

Students will work in pairs to play the game. Each pair will need a stack of 4-digit number cards and a whiteboard with marker. Each student in the pair will draw 1 card from the stack. The students will determine which number is greater. 1 student will write a number that would fall in between the 2 numbers on the cards. The next student must then write a number that would fall in between the greatest number on the cards and the number their partner wrote. The first student repeats, but writes a number that would fall in between the 2 new numbers – the 1 they wrote and the 1 their partner wrote. Students go back and forth, continuing to write numbers that fall between the 2 newest numbers. Students write 4 numbers each before discarding their cards and starting again with 2 new cards from the pile.

For example, the students draw 4,329 and 3,587. The first student writes the number "4,002." The next student writes the number "4,300," and so on.

Independent Practice Time: 6 min

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many items as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.

ESTAR INTERVENTION

25

Total Time: 25 minutes
Instructional Time: 19 minutes
Independent Practice: 6 minutes

Module: Place Value
Lesson 20

Comparing and Ordering Multi-Digit Numbers

Lesson Objectives	• The student will compare and order multi-digit numbers. • The student will use place-value language to order numbers.	
Vocabulary	**No new words are introduced.**	
Reviewed Vocabulary	compare, digits, greatest, least, order, period	
Instructional Materials	**Teacher**	**Student**
	• Teacher Masters (pp. 253-266) • *In Between* 5-digit number cards	• Student Booklet (pp. 127-133)

Preview

Say: **Today we will review what we have learned about comparing and ordering numbers.**

Engage Prior/Informal Knowledge Time: 3 min

Review the strategy for locating numbers on the number line. Have students turn to the *Engaged Practice Sheet*. Work together to complete the questions.

Say: **We will locate numbers on the number line. This skill helps us build a mental picture of how numbers are related to each other.**

Look at your sheet. What are the numbers we must locate on the number line? *(3,406 and 3,046)*

What are your first observations about these numbers? *(both are in the thousands; 3,406 is greater than 3,046; both have 4 digits; accept other reasonable answers)*

What is the least and greatest number on the number line? *(3,000 and 3,500)*

Is 3,406 closer to 3,000 or 3,500? *(3,500)* **Write it. Looking at the number line, put your finger where you think 3,406 is located.**

Check students' estimation for the location of 3,406 on the number line. Provide corrective feedback as needed.

Say: **Make a hash mark on the number line where you think the number should be, and then label the hash mark "3,406."**

Is 3,046 closer to 3,000 or 3,500? *(3,000)* **Write it. Looking at the number line, put your finger where you think 3,046 is located.**

Check students' estimation for the location of 3,046 on the number line. Provide corrective feedback as needed.

Say: **Make a hash mark on the number line where you think 3,046 should be, and then label the hash mark "3,046."**

Make 1 more hash mark on the number line and label it with the number you think should be located there. *(accept answers between 3,000 and 3,500)*

Modeled Practice — Time: 8 min

1. Write 5-digit numbers in order. Choose a number that would fit in the sequence.

Have students turn to ***Modeled Practice Sheet #1***. The teacher and students should complete the steps as the lesson progresses.

Say: **Read the numbers.** *(12,589; 13,243; 12,401; 12,035)*

Are these numbers in order from least to greatest? *(no)*

Have students write the numbers in order from least to greatest. Read the numbers again as a group, this time in order.

Say: **What is the least and the greatest number in the list of ordered numbers?** *(12,035 and 13,243)*

Look at the list of numbers at the bottom of the page. Read the numbers. *(13,496; 11,019; 12,636)*

Which 1 of these numbers would be inside the range of the ordered numbers? *(12,636)* **How do you know?** *(accept reasonable explanations that include comparing the numbers)*

Where would it go in the sequence from least to greatest? *(between 12,589 and 13,243)* **How do you know?** *(12,636 is greater than 12,589, but less than 13,243)*

Write another number that would be between the least and greatest number of the ordered numbers. *(accept any number between 12,035 and 13,243)* **Write it.**

2. Order 5-digit numbers from a table.

   Use ***Modeled Practice Sheet #2***. The teacher and students should complete the steps as the lesson progresses.

Say: **The table shows the seating capacity for 5 major league baseball parks. We will use this table to answer the questions that follow.**

First, what does this table tell us? *(the number of people who can attend a game at each baseball park)*

Which baseball parks are listed in the table? *(Minute Maid Park, Rangers Ball Park, Yankee Stadium, Dodger Stadium, and Wrigley Field)*

What is the number of seats at Wrigley Field? *(41,160)* **Write it.**

Read the next question. *(which baseball park holds the most people?)*

When looking for the park that holds the most people, will you look for the greatest number or the least number? *(greatest number)* **Which baseball park holds the most people?** *(Dodger Stadium)* **Write it.**

Read the second question. *(which baseball park holds the least number of people?)* **Which park is it?** *(Minute Maid Park)* **Why?** *(because 40,950 is the least number)* **Write it.**

What is the next question? *(about how many more people does Dodger Stadium hold than Minute Maid Park?)* **To solve this problem we need to know how many people each park can hold. Write down the number of people who can attend the 2 parks.** *(40,950 and 56,000)*

The question asks, "About how many…" Does this mean the exact answer or a good guess? *(a good guess)*

To make a good guess, let's look at the thousands period in each number. What number is in the thousands period for 40,950? *(40)*

What number is in the thousands period for 56,000? *(56)*

What is the difference between 40 and 56? *(16)* **We are in the thousands period, so what is the value of 16 in the thousands period?** *(16,000)*

Looking at the choices, which choice is the closest to 16,000? *(b, about 15,000)*

About how many more people does Dodger Stadium hold than Minute Maid Park? *(about 15,000)*

Is the number of seats at Wrigley Field closer to the number of seats at Minute Maid Park or Ranger Ball Park? *(Minute Maid Park)* **How do you know?** *(Wrigley Park is just over 41,000 compared to Minute Maid Park, which is almost 41,000)* **Write it.**

What is the second largest baseball park in the list? *(Yankee Stadium)* **Write it.**

Practice — Time: 8 min

Activity 1: Students will practice ordering numbers from least to greatest and greatest to least.

Have students turn to the ***Practice Sheets*** on pages 130 and 131. Gradually fade teacher assistance. Students may work with a math partner to complete both pages.

Say: **Work with your math partner to complete the practice sheets.**

Activity 2: Students will practice concepts while playing the *In Between* game.

Students will work in pairs to play the game. Each pair will need a stack of 5-digit number cards and a whiteboard with marker. Each student in the pair will draw 1 card from the stack. The students will determine which number is greater. 1 student will write a number that would fall in between the 2 numbers on the cards. The next student must then write a number that would fall in between the greatest number on the cards and the number their partner wrote. The first student repeats by writing a number that would fall in between the 2 new numbers – the 1 they wrote and the 1 their partner wrote. Students go back and forth, continuing to write numbers that fall between the 2 newest numbers. Students write 4 numbers each before discarding their cards and starting again with 2 new cards from the pile.

For example, students draw 34,329 and 33,587. The first student writes the number "34,002." The next student writes the number "34,190," and so on.

Independent Practice — Time: 6 min

1. For 5 minutes: Have students turn to the ***Independent Practice Sheets*** and complete as many items as possible.

Say: **You will work independently for 5 minutes. Complete as many items as you can. At the end of 5 minutes, we will discuss our answers as a group.**

2. For the remaining time: Have students share their answers with the group. Provide corrective feedback using mathematical language from the lesson. Have students mark the total number correct at the top of the page.