**The BIG Idea**

Having a firm understanding of place value is essential to nearly all aspects of mathematics. Students will learn the place value for numbers through millions and for decimals through millionths. Chapter 1 will serve as the building block for all future lessons by helping to teach students to identify, order, and compare whole numbers and decimals.

**Targeted Standards**

**GLE 0506.1.2** Apply and adapt a variety of appropriate strategies to problem solving, including estimation, and reasonableness of the solution.

**GLE 0506.2.1** Extend the understanding of place value through millions and millionths in various contexts and representations.

**Skills Trace**

**Vertical Alignment**

**Previous Grade**

In the previous grade, students learned to:

- Read, write, compare, order, and round whole numbers through the millions.
- Read, write, and compare decimals through the hundredths.

**This Grade**

During this chapter, students learn to:

- Read, write, compare, and order whole numbers.
- Read, write, compare, and order decimals through millionths.
- Use models to represent fractions that name tenths, hundredths, and thousandths as decimals.

After this chapter, students learn to:

- Multiply and divide whole numbers.
- Add and subtract decimals through thousandths.

**Next Grade**

In the next grade, students learn to:

- Solve real-world problems involving multiplication and division of decimals.
- Convert between fractions, decimals, and percent forms of rational numbers.

**Vertical Alignment and Backmapping**

McGraw-Hill’s *Math Connects* program was conceived and developed with the final results in mind: student success in Algebra 1 and beyond. The authors developed this brand-new series by backmapping from Algebra 1 concepts, and vertically aligning the topics so that they build upon prior skills and concepts and serve as a foundation for future topics.
# Chapter at a Glance

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**This program is supported with a variety of digital solutions online, on DVD, and on CD.**
Math Vocabulary

**Glossary**

The following math vocabulary words are listed in the glossary of the *Student Edition*.

Find interactive definitions in 13 languages in the eGlossary and review vocabulary eGames at connectED.mcgraw-hill.com.

**decimal** A number that has a digit in the tenths place, hundredths place, and beyond.  
Example: 46.0892

**decimal point** A period separating the ones and the tenths in a decimal number.  
Example: 0.8 or $3.77

**equivalent decimals** Decimals that have the same value.  
Example: 0.3 and 0.30

**expanded form** A way of writing a number as the sum of the value of its digits.  
Example: $30 + 6 + 0.2 + 0.005$

**place value** The value given to a digit by its position in a number.  
Example: 36.205; The digit 2 has a value of 0.2 because it is in the tenths place.

**standard form** The usual or common way of writing a number using digits.  
Example: 67,542

**Activity**

Provide students with number tiles and symbol tiles, including plus signs (+), equals sign (=), less than (<), greater than (>), and the decimal point. Focus on the vocabulary words and ask students to create numbers, equations, and inequalities using the tiles. Have students record their numbers, equations, and inequalities in their Math Journals.

Students can also work in pairs to complete the activity. One partner names the vocabulary term and the second partner creates the numbers, equations, and inequalities using the tiles.

**Visual Vocabulary Cards**

Use Visual Vocabulary Cards to reinforce the vocabulary in this chapter in English and Spanish. (The Define/Example/Ask routine is printed on the back of each card.)
Whole Numbers

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<td>Listen and Write</td>
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<td></td>
<td>Peer Teaching</td>
<td>On and Beyond Level</td>
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Decimals

<table>
<thead>
<tr>
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<th>Activity</th>
<th>Modality</th>
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</thead>
<tbody>
<tr>
<td>AL</td>
<td>Activate Prior Knowledge</td>
<td>Logical-Mathematical</td>
</tr>
<tr>
<td>OL</td>
<td>Activate Prior Knowledge</td>
<td>Linguistic</td>
</tr>
<tr>
<td>BL</td>
<td>Writing and Speaking</td>
<td>Spatial</td>
</tr>
<tr>
<td></td>
<td>Bilingual Cooperative Learning</td>
<td>On and Beyond Level</td>
</tr>
</tbody>
</table>

Order Whole Numbers and Decimals

<table>
<thead>
<tr>
<th>Level</th>
<th>Activity</th>
<th>Modality</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>Word Meanings</td>
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<td></td>
<td>Presentation</td>
<td>On and Beyond Level</td>
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</tbody>
</table>

ELL Resources

- The Professional Development articles listed below can be found in the Teacher Resource Handbook.
- “English Learners and Mathematics: Best Practices for Effective Instruction” by Kathryn Heinze (pp. TR32–TR33)
- “Engaging English Language Learners in Your Classroom” by Gladis Kersaint (pp. TR34–TR35)
- Multilingual eGlossary
- Visual Vocabulary Cards
- Language Alerts (pp. 17, 21, 26, 27, 42)
- ELL Guide (pp. 8, 16, 17)

Real-World Problem Solving Library

Math and Science: Water Works

Use these leveled books to reinforce and extend problem-solving skills and strategies.

- Leveled for: On Level
- Approaching Level
- Beyond Level
- Spanish

For additional support, see the Real-World Problem Solving Readers Teacher Guide.

Leveled Reader Database

connectED.mcgraw-hill.com

- Content Area
- Lexile Score
- Benchmark Level

Library Books

- Million to Measure
  - David M. Schwartz

- If You Made a Million
  - David M. Schwartz

- Alexander Who Used to Be Rich Last Sunday
  - Judith Viorst

- Little Numbers and Pictures That Show Just How Little They Are!
  - Edward Packard

- The Toothpaste Millionaire
  - Jean Merrill

As a part of the chapter, we provide support for reading and language arts. This can be found in the Reading and Languages Arts Support included in the Chapter Overview of the Teacher Edition.
Animal Exhibit
Make a group presentation of animals, ordered by population.

- Using the Internet or other resources, each person chooses an animal to research, then writes a short paragraph about the animal on a poster. Include a picture of the animal. The heading on the poster should be the animal’s name and worldwide population.
- As a group, order your posters. Start from the animal with the smallest population and continue to the largest population. Be sure to take time to read each poster in your group animal exhibit.

Materials:
- animal books
- Internet
- magazine photos of animals
- posterboard
- colored markers

Place-Value Necklaces
Create a beaded necklace that represents a number.

- Create a place-value chart with six places on it, including the thousands and ones periods.
- Roll the number cube, and fill in the place-value chart spaces from left to right. Now you have the number for your necklace.
- Pick one color and string the amount of beads to represent the number you rolled for the hundred-thousands position. Do the same for each place value, going from left to right, using a different color bead for each place value.

Materials:
- at least 9 beads each of six different colors
- beading thread or cord
- number cube
- paper
- pencil

Arguing Animals
- Write a story about two animals who love to compete with one another.
- The first animal will say that he can do something and the second animal will always say that he can do it better.
- For example, the first animal might say that she can run 15,483 feet in only three minutes. The second animal would then say that he can run 19,432 feet in three minutes.

Materials:
- paper
- pencil
Health

Who Is the Fastest?
Go for a run with a number cube . . . who will have the fastest time?

- Each person rolls a number cube four times to get a race time: the first number rolled is the number of minutes, the second number is seconds, the third number is tenths of seconds, and the fourth number is hundredths of seconds. Choose a timekeeper to write down each person’s time.
- As a group, create a chart listing the running times of each person in order from fastest to slowest. Who won?

<table>
<thead>
<tr>
<th>Student</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winona</td>
<td>3 min 2.25 sec</td>
</tr>
<tr>
<td>Rey</td>
<td>3 min 2.01 sec</td>
</tr>
</tbody>
</table>

Materials:
- number cubes
- paper
- pencils

Music

Count That Tune
How many beats does your favorite song have?

- Pick a song from a music book. It can be as simple as the song “Mary Had A Little Lamb.”
- Clap out the beats to the song as you sing or listen. Your partner will count the beats and write the total. Do the same for your partner’s chosen song.
- Each person writes a sentence comparing the two-beat totals using either >, <, or =. Whose song had the most beats?

Materials:
- music books
- paper
- pencils

Social Studies

The Price Is . . .

- Prices of things we need change over time.
- Choose a partner. Each person makes up a set of two price cards for at least five items you buy regularly. One price is the real price and the other could be from the past or future.
- Draw a picture of each item and place the corresponding price cards by each picture. Challenge your partner to find the real price. Then your partner makes up a sentence using the real price and either >, <, or = to compare it to the other price.
**Introduce the Chapter**

**Essential Question**

*Why is it important to understand place value?*

Sample answer: Understanding place value can help you compare and order numbers, as well as to correctly add and subtract them.

**WRITE MATH**

- Explain that the position of a digit in a number determines the digit’s value.
- Place a piece of masking tape on the floor to create a number line. On the tape, write the numbers 0–12. Ask one student to stand on each number.
- **Name a number greater than 6.** Sample answer: 11
- **How do you know?** Sample answer: 11 is a two-digit number and 6 is a one-digit number.
- **Name a number less than 4.** Sample answer: 2
- **How do you know?** Sample answer: 2 is to the left of 4.

**Foldables**

*Go to connectED.mcgraw-hill.com to provide students with directions to create their own Foldables graphic organizers for this chapter. Students may also use their Foldables to study and review for chapter assessments.*

**When to Use It** Multi-Part Lessons 1A, 2B, 2C, 2D and 3A. (Additional instructions for using the Foldable with these lessons are found in the Mid-Chapter Check and Chapter Study Guide and Review.)

**Key Vocabulary**

Introduce the Key vocabulary in the chapter using the routine below.

**Define:** A number that has a digit in the tenths place, hundredths place, and beyond.

**Example:** 3.890

**Ask:** How are decimals related to money?

---

**Chapter Project**

**Map It!** Students create a map of the United States, record the land area of each state, and create a guide to the states.

- Students use poster board and markers to draw an outline map of the United States.
- Students use the Internet or other resources to find out the land area of each of the 50 states. They write each state’s land area on its corresponding space on the map.
- Students create a guide to their map, listing the states in order of land area, from least to greatest in a two-column table.
- Challenge students to find the total land area of the United States using the figures they have written on the chart.

**Refer to Chapter Resource Masters for a rubric to assess students’ progress on this project.**
When Will I Use This?

Greenhouse Shopping Spree

Read the story. You may wish to use the blank Graphic Novels provided in Hands-On Activity Tools and Resources to help develop writing and speech skills.

- How do you compare prices when you are shopping? Sample answer: Use place value to compare the numbers.

- What other numbers do you compare when you are shopping? Sample answer: Package sizes often have numbers to indicate weight or volume.

✔ 0506.1.9 Use age-appropriate books, stories, and videos to convey ideas of mathematics.

For additional reading and language arts activities, including support for reading a graphic novel, see Reading and Language Arts Support in the Grade 5 Math Connects Program Overview.

Animated Graphic Novel

Visit connectED.mcgraw-hill.com to download the animated version of “Greenhouse Shopping Spree.”

Your Turn!

In Lessons 2D and 3A, students will learn more about comparing decimals.

- Read the Math at Home letter found in the Chapter Resource Masters with the class and have each student sign it. A Spanish version is also included. Use the Spanish letter for Spanish-speaking parents or guardians who do not read English fluently.

- Send home copies of the Math at Home letter with each student.

For more information about parent involvement, read the article, “The Role of Parents and Guardians in Young Children Learning Mathematics” by Paul Giganti, Jr. See the Teacher Resource Handbook pp. TR44–TR45.
You have two options for checking Prerequisite Skills for this chapter.

Text Option

“Are You Ready for the Chapter?”

Online Option

Take the Online Readiness Quiz.

Are You Ready for the Chapter?

You have two options for checking Prerequisite Skills for this chapter.

Text Option

Take the Quick Check below.

Quick Check

Write each number in word form.

1. 8 eight
2. 15 fifteen
3. 23 twenty-three
4. 44 forty-four
5. 160 one hundred sixty
6. 371 three hundred seventy-one

Write the number that represents each point on the number line.

7. Q 2
8. S 8
9. R 5
10. T 12
11. V 1
12. W 15

Write each sentence using the symbols <, >, or =.

13. 8 is less than 12. 8 < 12
14. 25 is greater than 10. 25 > 10
15. 136 is equal to 136. 136 = 136
16. 471 is greater than 470. 471 > 470
17. The high temperature yesterday was 64°F. The high temperature today is 70°F. Write 64 is less than 70 using symbols. 64 < 70

Online Option

Take the Online Readiness Quiz.
**2 DIAGNOSE AND PRESCRIBE**

**RtI (Response to Intervention)**
Based on the results of the Diagnostic Assessment, use the charts below to address individual needs before beginning the chapter.

**TIER 1**
**On Level**
**If**
students miss three to five in Exercises 1–17,

**Then**
choose a resource:
- [EL] Learning Stations  (pp. 14E–14F)
- [C] Are You Ready? Practice
- [DE] Self-Check Quiz

**TIER 2**
**Strategic Intervention**
approaching grade level

**If**
students miss six to ten in Exercises 1–17

**Then**
choose a resource:
- [C] Are You Ready? Review
- [DE] Lesson Animations

**TIER 3**
**Intensive Intervention**
2 or more years below grade level

**If**
students miss eleven or more in Exercises 1–17

**Then**
use *Math Triumphs*, an intensive math intervention program from McGraw-Hill
Chapter 1 Place Value and Number Relationships
Chapter 7 Decimals

**Beyond Level**

**If**
students miss two or fewer in Exercises 1–17

**Then**
choose a resource:
- [E] Chapter Project  (p. 14)
- [C] Are You Ready? Apply
- [DE] eGames: Bowl-O-Matic

---

**3 REASSESS**

Administer the Diagnostic Test.

Administer the Chapter Resource
Master Diagnostic Test to reassess students’ skills before beginning the chapter.
**Essential Question**

How is comparing the values of 5 and 15 similar to comparing the values of 5,000,000 and 15,000,000? **Sample answer:** The number 15 has a greater value than 5, because it extends to another place value, the tens place. Therefore, the number 15 million (15,000,000) has a greater value than the number 5 million (5,000,000) because it extends to the next place value, the ten millions.

**Focus on Math Background**

The understanding of greater numbers has become increasingly important. Comparing and ordering numbers can be difficult for students because:

- Although we read from left to right in English, we do not count place value that way.
- Some Spanish-speaking countries use commas in the place of our periods.
- Metric numbers do not use commas between periods. So, children coming from countries using the metric system may need additional support.

---

**PART A**  
**Title/Objective**  
Place Value Through Millions  
(pp. 17–20)

Read and write whole numbers through the millions.

**Standards**  
GLE 0506.2.1

**Vocabulary**  
place-value chart, period, place value, standard form, expanded form

**Materials/Manipulatives**  
stop watch  
two-color counters

**Resources**

- Leveled Worksheets  
- Visual Vocabulary Cards  
- Lesson Animations  
- Daily Transparencies  
- Problem of the Day  
- Self-Check Quiz  
- Personal Tutor  
- Virtual Manipulatives  
- Math Song Animations

**PART B**  
**Title/Objective**  
Compare and Order Whole Numbers Through Millions  
(pp. 21–23)

Compare and order whole numbers through millions.

**Standards**  
GLE 0506.2.1

**Vocabulary**

**Materials/Manipulatives**  
index cards, notebook paper, ruler, scissors, quarter-inch grid paper

**Resources**

- Leveled Worksheets  
- Lesson Animations  
- Daily Transparencies  
- Problem of the Day  
- Self-Check Quiz  
- Personal Tutor  
- Virtual Manipulatives  
- eGames: Mount Frost  
- Hands-On Activity Tools and Resources

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**Suggested Pacing**  
(10 Days)

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<th>3</th>
<th>Assess</th>
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<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
</tr>
<tr>
<td><strong>Days</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

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**Note:** All digital assets are Interactive Whiteboard ready.
Problem-Solving Investigation: Use the Four Step Plan  (pp. 24–25)

Use the four-step plan to solve a problem.

GLE 0506.1.2

Vocabulary

poster board

Materials/Manipulatives

Resources

Leveled Worksheets  ✔ 0506.1.9
Daily Transparencies
Problem of the Day
Personal Tutor

Hands-On Activity Tools and Resources

Notes
**Differentiated Instruction**

**Approaching Level**

**Option 1**

*Use with 1A*

**Hands-On Activity**

*Materials:* highlighters, pencils, WorkMat 4: Place-Value Chart from *Hands-On Activity and Tools Resources* (p. 67)

- Write the following numbers on the board:
  
  2,468,057  
  74,319,732  
  831,046,969

- Give each student three copies of WorkMat 4: Place-Value Chart. Then have them copy each number onto a chart.

- Have students read each number.

- Tell students to use a highlighter to highlight the number 4 in each number and identify its place value.
  
  four hundred thousand; four million; forty thousand

**Option 2**

*Use with 1B*

**Hands-On Activity**

*Materials:* two 1-inch circles of colored paper per student, 1-inch digit cards

- Write the numbers below on the board.
  
  5,854,672  
  5,845,672

- Have students create the numbers using digit cards.

- Have students place a colored circle under the first digit of each of two numbers to be compared.

- If the first digits of the two numbers are identical, move right to the next digit in each number and repeat the comparison.

- Compare until unlike digits are found. Underline those digits.

- Remove the circles and identify value. Place symbol: >, <, or = 5,854,672 = 5,854,672

**Other Options**

- Learning Station Cards 1, 2

- Personal Tutor, Lesson Animations, Virtual Manipulatives, Math Song Animations: *Mighty Big Numbers*, eGames: *Mount Frost*

**On Level**

**Option 1**

*Use with 1A*

**Hands-On Activity**

*Materials:* encyclopedias, almanacs, or Internet

- Challenge students to find at least three examples of millions in an encyclopedia, an almanac, or the Internet. Have students record their findings.

- The projected U.S. population in 2050 is 403,943,000.

- Next, have students exchange papers and write three of the numbers in word and in expanded form.

- Have students check each other’s work.

**Option 2**

*Use with 1B*

**Hands-On Activity**

*Materials:* glue, paper, pencils, newspapers, scissors

- Have students look through a newspaper to find real-world examples of number comparisons.

- Have students cut out their examples and glue them onto pieces of paper.

- These examples may be displayed on a bulletin board.

**Other Options**

- Learning Station Cards 3, 5

- Personal Tutor, Lesson Animations, Virtual Manipulatives, Math Song Animations: *Mighty Big Numbers*, eGames: *Mount Frost*
English Language Learners

This strategy helps students English Learners learn and use the language of place value through millions.

Find Core Vocabulary and Common Use Verbs in the online EL strategies to help students grasp the math skills; use Language Alerts at point of use in the Teacher Edition.

**AL** Beginning

**Background Knowledge** Use prior knowledge of size to understand place value through millions.

- Have students line up according to height. Point to the shortest. Say, “[Student’s name] is first.” Point to the others in turn and say, “[Name] is taller.”
- Write 5,489,237 in a grid, vertically. Use zeros as place holders. Say, “7 is in the ones place. 3 is in the tens place.” Continue, using place value names through millions. Have students repeat each place value chorally. Stress the /s/ ending for each place value.
- Write 5,489,237 in a grid, vertically. Use zeros as place holders. Say, “7 is in the ones place. 3 is in the tens place.” Continue, using place value names through millions. Have students repeat each place value chorally. Stress the /s/ ending for each place value.
- Write 5,489,237 in a grid, vertically. Use zeros as place holders. Say, “7 is in the ones place. 3 is in the tens place.” Continue, using place value names through millions. Have students repeat each place value chorally. Stress the /s/ ending for each place value.

**OL** Intermediate

**Listen and Write** Internalize place-value words.

- Write a seven-digit number frame. Label each place value.
- Then have them exchange problems with another student and solve using the four-step problem-solving plan.
- Students should record the answers to each step in their Math Journals. Challenge students to identify the specific strategy that was used to solve the problem, such as drawing a picture, working backward, or solving a simpler problem.

**BL** Advanced

**Cognates** Connect Spanish and English place-value words.

- Ask, “How do you say million in Spanish (millón /mee-ljun/)?” Have students repeat in English and Spanish.
- Have multilingual groups write and read aloud seven-digit numbers in their native language and in English.

**Extend**

Have bilingual pairs write on slips of paper the place values of each of the digits in a seven-digit number in native language. Partners decode and write the number in correct order.

---

**Beyond Level**

**Option 1** Use with 1A

**Hands-On Activity**

**Materials:** paper, pencils

- Display the following riddle for pairs of students to solve:

```plaintext
I am a 7-digit number. The sum of my digits is 27. The value of my thousands digit is 5,000 and the value of my hundreds digit is 700. My hundred-thousands digit is 2 less than my thousands digit and 3 less than my millions digit. My ones digit is 3 less than my hundreds digit and 2 more than my tens digit. Who am I? 6,305,724
```

- Next, tell each student to write a similar riddle on their own.
- Have students exchange their riddles with their partners and solve them.

**Option 2** Use after 1C

**Materials:** paper and pencil

- Have students write a word problem about their favorite hobby.
- Then have them exchange problems with another student and solve using the four-step problem-solving plan.
- Students should record the answers to each step in their Math Journals. Challenge students to identify the specific strategy that was used to solve the problem, such as drawing a picture, working backward, or solving a simpler problem.

**Other Options**

- **Learning Station Card 3**
- **Lesson Animations, Math Song Animations:** Mighty Big Numbers, eGames: Mount Frost

---

**English Language Learners**

This strategy helps students English Learners learn and use the language of place value through millions.

Find Core Vocabulary and Common Use Verbs in the online EL strategies to help students grasp the math skills; use Language Alerts at point of use in the Teacher Edition.

**AL** Beginning

**Background Knowledge** Use prior knowledge of size to understand place value through millions.

- Have students line up according to height. Point to the shortest. Say, “[Student’s name] is first.” Point to the others in turn and say, “[Name] is taller.”
- Write 5,489,237 in a grid, vertically. Use zeros as place holders. Say, “7 is in the ones place. 3 is in the tens place.” Continue, using place value names through millions. Have students repeat each place value chorally. Stress the /s/ ending for each place value.

**OL** Intermediate

**Listen and Write** Internalize place-value words.

- Write a seven-digit number frame. Label each place value.
- Then have them exchange problems with another student and solve using the four-step problem-solving plan.
- Students should record the answers to each step in their Math Journals. Challenge students to identify the specific strategy that was used to solve the problem, such as drawing a picture, working backward, or solving a simpler problem.

**BL** Advanced

**Cognates** Connect Spanish and English place-value words.

- Ask, “How do you say million in Spanish (millón /mee-ljun/)?” Have students repeat in English and Spanish.
- Have multilingual groups write and read aloud seven-digit numbers in their native language and in English.

**Extend**

Have bilingual pairs write on slips of paper the place values of each of the digits in a seven-digit number in native language. Partners decode and write the number in correct order.
**Professional Development**

**Reading Greater Numbers**

Students will read greater numbers with ease and understanding if they break it apart into the place value periods. Each place value period is a three-digit number read as hundreds, tens, and ones. After reading the number, students simply say the name of the period.

<table>
<thead>
<tr>
<th>Millions</th>
<th>Thousands</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Write: 1,478,907

Read: one million, four hundred seventy-eight thousand, nine hundred seven

As an extension, challenge your students to read even greater numbers:

<table>
<thead>
<tr>
<th>Millions</th>
<th>Thousands</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Write: 875,612,082

Read: eight hundred seventy-five million, six hundred twelve thousand, eighty-two

**Assessment Tip**

Homework can be used to assess the understanding of the math concepts taught in a lesson as well as to pinpoint the areas where students struggle.

- Let students know you will collect homework at least 2 or 3 times a week, but don’t tell them which days.
- When homework is collected, choose just a few representative problems to look at.
- Select 4 or 5 students each day for a quick interview. Ask them to explain one or two of the problems you chose.
- Keep a record of responses from each student in a notebook. Make sure all students have participated in the quick interview before you call their name again.

**Notes**
Place Value Through Millions

Did you know that one TV game show contestant has won more than $3,620,000? There are different ways to represent this number.

You can read it as:
• three million, six hundred twenty thousand

You can write it as:
• 3,620,000
• 3,000,000 + 600,000 + 20,000

A place-value chart shows the value of the digits in a number. In greater numbers, each group of three digits is separated by commas and is called a period.

<table>
<thead>
<tr>
<th>Millions Period</th>
<th>Thousands Period</th>
<th>Ones Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>hundreds</td>
<td>tens</td>
<td>ones</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A digit and its place, or place value, name a number. For example, in 3,620,000, the digit 2 is in the ten thousands place. Its value is $2 \times 10,000$, or 20,000.

Building Math Vocabulary

Write the vocabulary words and their definitions on the board. Take a few minutes to review each word with the students. It is important that they understand the definitions for this lesson.

Visual Vocabulary Cards

Use Visual Vocabulary Cards to reinforce the vocabulary in this lesson in English and Spanish. (The Define/Example/Ask routine is printed on the back of each card.)

Objective

Read and write whole numbers through the millions.

Vocabulary

place-value chart
period
place
place value
standard form
expanded form

Resources

Materials: stopwatch, Math Song Animation: Mighty Big Numbers
Manipulatives: two-color counters
Leveled Worksheets

Activity Choice 1: Hands-On

• Ask students to count to 100. Use a stopwatch to time how long it takes them.

• How long would it take to count to 1,000? multiply their time by 10

• How long would it take to count to 100,000? to 1,000,000? multiply their original time by 1,000; multiply their original time by 10,000

• You may have to do the multiplication for the students.

Activity Choice 2: Music

• Draw a place-value chart to the hundred millions place. Next, play Math Song Animation: Mighty Big Numbers.

• Model the numbers in the song. Have students decide where to write each digit in the place-value chart.

• Repeat the process using several different numbers.

• How many hundred thousands equal one million? Explain. Sample answer: 10; The hundred thousands place is one place to the left of the one millions place.
**Scaffolding Questions**

- Tell students that a place-value chart can be used to read and write numbers. Draw a place-value chart from ones to hundred millions on the board.

- Remind students that as you move to the left one place value at a time, the value of the number increases by \( \times 10 \). So, \( 100,000 = 10,000 \times 10 \).

- Suppose the population of a state is 18,089,888. How would you write this number in the place-value chart? See students’ work.

- What digit is in the one millions place? the ten millions place? 8; 1

- Which place values do not have an 8 in them? ten millions, hundred thousands, and thousands

### ADDITIONAL EXAMPLES

1. **The number of reptiles that are owned as pets in the United States is 7,540,000. Use a place-value chart to show the value of this number.**

<table>
<thead>
<tr>
<th>Millions</th>
<th>Thousands</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>hundreds</td>
<td>tens</td>
<td>ones</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

2. **The students at Harvey Elementary School have saved 3,100,750 pennies. Write 3,100,750 three ways.**
   - 3,100,750; three million, one hundred thousand, seven hundred fifty; 3,000,000 + 100,000 + 700 + 50

3. **The total area of China is three million, seven hundred five thousand, four hundred seven square miles. Write this number in standard form and expanded form.**
   - 3,705,407; 3,000,000 + 700,000 + 5,000 + 400 + 7

### REAL-WORLD EXAMPLE

**Read and Write Numbers**

**SCIENCE** The human eye blinks an average of 5,500,000 times a year. Write 5,500,000 three ways.

- **Standard form:** 5,500,000
- **Word form:** five million, five hundred thousand
- **Expanded form:** 5,000,000 + 500,000

---

**TEACH**

**Scaffolding Questions** give direction and momentum to the lesson, clarify its purpose, and keep students on task.

**Place Value**

The standard form of a number is the usual or common way to write a number using digits. The expanded form of a number is a way of writing a number as the sum of the values of its digits. The places with zero as a digit are not included in the expanded form.

**Place Value Chart**

<table>
<thead>
<tr>
<th>Millions</th>
<th>Thousands</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>hundreds</td>
<td>tens</td>
<td>ones</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

List the values of each digit.
- \( 4 \times 1,000,000 = 4,000,000 \)
- \( 2 \times 100,000 = 200,000 \)
- \( 9 \times 10,000 = 90,000 \)
- \( 9 \times 1,000 = 9,000 \)

The **standard form** of a number is the usual or common way to write a number using digits. The **expanded form** of a number is a way of writing a number as the sum of the values of its digits. The places with zero as a digit are not included in the expanded form.
5. four million, five hundred sixty-two thousand seven
   4,000,000 + 500,000 + 60,000 + 2,000 + 7
6. two million, forty-three thousand, nine hundred eighty
   2,000,000 + 40,000 + 3,000 + 900 + 80
7. six million, three hundred two thousand, eight hundred six
   6,000,000 + 300,000 + 2,000 + 800 + 6
8. thirty-eight million, eight hundred seventy-five
   30,000,000 + 8,000,000 + 800 + 70 + 5

Write the value of the underlined digit. See Example 1

1. 469,9
2. 1,040,710
3. 35,098,098
4. 83,023,215

Write each number in word form and expanded form. See Example 2

5. 4,562,007
6. 2,043,980
7. 6,302,806
8. 38,000,875

9. Write nine hundred thousand, five hundred fifty-two in standard
   form and expanded form. See Example 3

10. On Sunday, 2,617,000 newspapers were sold. Write the number of newspapers sold in word form and expanded form. 10, 11. See Answer Appendix.

As a class, have students complete the Check What You Know Exercises as you observe their work.

The Alternate Teaching Strategy provides suggestions for remediation for students who need additional help understanding the concept.

Talk Math exercises at the end of the Check section provides an informal assessment opportunity to gauge student comprehension.
Differentiated practice using these leveled assignments for the exercises in Practice and Problem Solving.

<table>
<thead>
<tr>
<th>Level</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>Approaching Level</td>
</tr>
<tr>
<td>OL</td>
<td>On Level</td>
</tr>
<tr>
<td>BL</td>
<td>Beyond Level</td>
</tr>
</tbody>
</table>

H.O.T. Problems
Have students discuss and complete the Higher Order Thinking problems. Encourage them to use a place-value chart to find their answers.

WRITE MATH
Have students complete the Write Math Exercise in their Math Journals. You may choose to use this exercise as an optional formative assessment.

Homework Practice Worksheet
Problem-Solving Practice Worksheet

4 ASSESS
Formative Assessment

- How many different ways can you write a number? Explain. Sample answer: 3 ways; standard form, use digits to write the number; word form, use words to write the number; and expanded form, write the number showing the value of each digit.

Quick Check
Are students continuing to struggle with reading and writing whole numbers through the millions?

During Small Group Instruction
If Yes → AL Daily Transparencies
AL Differentiated Instruction Option 1 (p. 17c)
AL Strategic Intervention Guide (pp. T6–T7, T118, T120)
If No → OL Differentiated Instruction Option 1 (p. 17c)
BL Differentiated Instruction Option 1 (p. 17d)
OL Skills Practice Worksheet
BL Enrich Worksheet

Practice and Problem Solving
Write the value of the underlined digit. See Example 1
12. 3,132,685  600  13. 5,309,573  300,000  14. 1,309,841  9,000
15. 7,824,015  10
16. 40,245,854  40,000  17. 68,210,397  80,000,000
18. 73,581,209  200
19. 97,530,284
20. 7,000,000

Write each number in word form and expanded form. See Example 2
12. 1,429,205  21. 7,082,009
22. 5,901,452
23. 8,200,013
24. 30,842,085  25. 63,930,053
26. 319,999,990
27. 800,493,301

Write each number in standard form and expanded form. See Example 3
28. eighty-three million, twenty-three thousand, seven
29. three hundred four million, eight hundred four thousand, four hundred
30. As of 2008, the population of the United States was about 304,967,000.
   Write the population in word form.
   three hundred sixty-seven thousand, nine hundred six thousand

H.O.T. Problems
31. Measurement
   The land area of Florida is 100,000 + 30,000 + 9,000 + 800 + 50 + 2 square kilometers.
   Write the area in word form.
   See Answer Appendix.

REAL-WORLD PROBLEM SOLVING

Planets
The Sun and Earth are shown.
32. The distance from Earth to the Sun is 92,955,793 miles. Write this number in word form and expanded form. See Example 2
33. The amount of time that American astronauts have spent in space is about 13,507,804 minutes. Is this number
   greater than 13,500,000? Explain.

Write Math
Write a few sentences about how yesterday’s concepts helped you with today’s lesson.

Yesterday’s News

H.O.T. Problems
34. CHALLENGE
   Write the number with the least value using the digits 1 through 9. Use each digit only once. 123,456,789
35. WRITE MATH
   Explain how you know what number is missing in 3,947 = 3,000 + 40 + 7. 3,947 has a 9 in the hundreds place; therefore, you know the missing digit has a value of 900.
   20 Place Value
**Main Idea**
I will compare and order whole numbers through millions.

**REAL-WORLD EXAMPLE**

**DATA** The table shows the two largest oceans in the world. Which ocean has a greater area?

<table>
<thead>
<tr>
<th>Ocean</th>
<th>Approximate Area (Square miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlantic Ocean</td>
<td>33,420,160</td>
</tr>
<tr>
<td>Pacific Ocean</td>
<td>64,186,600</td>
</tr>
</tbody>
</table>

**Step 1** Line up the numbers so that the digits in the ones place align.

33,420,160
64,186,600

**Step 2** Begin at the greatest place. Compare the digits.

33,420,160
64,186,600
6 > 3

64,186,600 > 33,420,160

So, the Pacific Ocean has a greater area.

**Language Alert!**

Extend Vocabulary: Arrow  Students may not know the English name for arrow and may need an example of an arrow to make the connection with greater than and less than signs clear.

**Building Math Vocabulary**

Write the symbols >, <, and =, examples, and their definitions on the board.

Have students record these symbols in their Math Journals.

In addition to the examples given on the board, have them write examples of their own.

**Objective**

Compare and order whole numbers through millions.

**Resources**

Materials: index cards, paper, ruler, scissors, quarter-inch grid paper

Hands-On Activity Tools and Resources (p. 133)

Leveled Worksheets

**INTRODUCE**

**Activity Choice 1: Hands-On**

Guide students to create a number line.

- Have students cut a piece of paper in half lengthwise and use a ruler to draw a straight line in the center of the paper. Label the line from 0 to 10.
- Are the numbers on the right greater than or less than the numbers on the left? greater than
- Are the numbers on the left greater than or less than the numbers on the right? less than

Tell students that an easy way to remember this is the number line has the greater than and less than symbols on it (the arrows at the ends).

**Activity Choice 2: Active Math**

- Draw the number line below on the board.

1,000 2,000 3,000 4,000 5,000 6,000

- Give student volunteers index cards labeled 2,250 and 4,100. Tell the students to stand at the locations on the number line that represent the numbers on their index cards.
- Which number is greater? How do you know? 4,100; It is to the right of 2,250.
- Repeat the activity with different numbers.
2. TEACH

Scaffolding Questions
Tell students that one babysitter charges $12 per hour while another sitter charges $8 per hour. Have students draw a number line from 0 to 15 and locate 12 and 8 on it.

- Which number is farther to the right? 12
- Which babysitter gets paid more? $12 babysitter

ADDITIONAL EXAMPLES

1. The table shows the amount of apples and oranges grown in a recent year. Which fruit was grown more? orange

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Amount Grown (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>64,965,056</td>
</tr>
<tr>
<td>Orange</td>
<td>69,343,709</td>
</tr>
</tbody>
</table>

2. The table shows the number of dogs owned in different countries. Use place value to order the data from greatest to least.

<table>
<thead>
<tr>
<th>Country</th>
<th>Dogs Owned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>27,000,000</td>
</tr>
<tr>
<td>Germany</td>
<td>4,800,000</td>
</tr>
<tr>
<td>Mexico</td>
<td>16,111,000</td>
</tr>
<tr>
<td>United States</td>
<td>61,340,000</td>
</tr>
</tbody>
</table>

Order Numbers

Order the numbers from greatest to least. See Example 2

<table>
<thead>
<tr>
<th>Country</th>
<th>Barrels Per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy</td>
<td>1,881,000</td>
</tr>
<tr>
<td>France</td>
<td>1,970,000</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1,827,000</td>
</tr>
<tr>
<td>United States</td>
<td>20,730,000</td>
</tr>
</tbody>
</table>

The numbers ordered from greatest to least are 20,730,000; 1,970,000; 1,881,000; and 1,827,000.

So, the order is the United States, France, Italy, and the United Kingdom.

CHECK What You Know

Replace each \(_{\text{<, >, or =}}\) to make a true sentence. See Example 1

1. 655,543 \(_{\text{<}}\) 556,543
2. 10,027,301 \(_{\text{<}}\) 10,207,301
3. 352,033,629 \(_{\text{=}}\) 352,033,629
4. 103,904,021 \(_{\text{<}}\) 103,904,120

Order the numbers from greatest to least. See Example 2

5. 145,099; 154,032; 145,004; 159,023
6. 145,099; 154,032; 145,004; 145,099; 145,099
7. 43,054,101; 34,608,101
8. 145,099; 154,032; 145,004; 159,023

Fruit

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Amount Grown (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>64,965,056</td>
</tr>
<tr>
<td>Orange</td>
<td>69,343,709</td>
</tr>
</tbody>
</table>

Order the countries from greatest to least area. Australia, India, Argentina, Norway

INTERACTIVE WHITEBOARD READY

As a class, have students complete the Check What You Know Exercises as you observe their work.

TALK MATH Use the Talk Math Exercise to assess student comprehension before assigning the practice exercises.

Alternate Teaching Strategy

If students have trouble comparing and ordering whole numbers through millions . . .

Then use one of these reteach options:

1. AL Reteach Worksheet
2. IWB Virtual Manipulatives Use the virtual place-value workmat to reteach the concept.
3. Use Grid Paper Have students write the numbers on quarter-inch grid paper, one under the other, lining up the digits of the numbers by place value. Tell them to begin at the left and compare digits until they find the place value where the digits are different.

22 Place Value
Replace each \( \_ \) with \(<\), \(>\), or \(=\) to make a true sentence. See example 1

9. 462,211 \( \_ \) 426,222 \(>\)
10. 42,359,909 \( \_ \) 42,324,909 \(<\)
11. 20,318,523 \( \_ \) 21,318,724 \(<\)
12. 132,721,424 \( \_ \) 132,721 \(>\)
13. 113,222,523 \( \_ \) 113,333,523 \(<\)
14. 767,676,767 \( \_ \) 676,767,676 \(>\)

Order the numbers from greatest to least. See Example 2

17. 138,023; 138,032; 139,006; 183,487
18. 3,452,034; 4,935,002; 34,035,952; 34,530,953
19. 731,364,898; 731,643,898; 73,264,898; 731,643,989
20. 395,024,814; 593,801,021; 395,021,814; 39,021,814

21. Rank the following states from least to greatest population.

<table>
<thead>
<tr>
<th>State</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>4,627,851</td>
</tr>
<tr>
<td>Colorado</td>
<td>4,861,515</td>
</tr>
<tr>
<td>Mississippi</td>
<td>2,918,785</td>
</tr>
<tr>
<td>Ohio</td>
<td>11,466,917</td>
</tr>
</tbody>
</table>

Mississippi, Alabama, Colorado, Ohio

22. Order the cars from most expensive to least expensive.

<table>
<thead>
<tr>
<th>Most Expensive Cars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bugatti Veyron</td>
</tr>
<tr>
<td>Pagani Zonda Roadster</td>
</tr>
<tr>
<td>Leblanc Mirabeau</td>
</tr>
<tr>
<td>Saleen S7</td>
</tr>
</tbody>
</table>

23. REASONING List all of the possible digits that can replace the missing digit to make a true statement. 75,\_83,791 > 75,631,814 6, 7, 8, or 9

24. OPEN ENDED Write three numbers that are greater than 75,000,000 but less than 75,400,000. Sample answers: 75,301,000; 75,302,000; 75,303,000

25. NUMBER SENSE Use the digits 1, 2, 3, 4, 5, 6, and 9 to create four numbers. Order them from least to greatest. Sample answer: 1,234,569; 1,324,569; 2,341,569; 5,691,234

26. WRITE MATH Write a real-world problem in which you would order three numbers from least to greatest. See students’ work.

Common Error!
Exercises 13, 18–22 Students may compare the first digits in each number without noticing that some numbers have fewer digits than others. Tell students to check the number of digits in each number before comparing the first digits of the numbers.

Ask students to use place value to compare 9,827,188 and 9,827,198. Tell them to show all their work and explain the steps they used to compare the numbers.

Differentiate practice using these leveled assignments for the exercises in Practice and Problem Solving.

<table>
<thead>
<tr>
<th>Level</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>Approaching Level</td>
</tr>
<tr>
<td>OL</td>
<td>On Level</td>
</tr>
<tr>
<td>BL</td>
<td>Beyond Level</td>
</tr>
</tbody>
</table>

Have students discuss and complete the Higher Order Thinking problems. Encourage them to double check their answers.

WRITE MATH Have students complete the Write Math Exercise in their Math Journals. You may choose to use this exercise as an optional formative assessment.

REPHRASE THE QUESTION Rephrase the question for students who need additional writing support.

Homework Practice Worksheet
Problem-Solving Practice Worksheet

Formative Assessment
Explain why any 8-digit whole number is greater than any 7-digit whole number. The ten millions place has more value than the millions place.

Quick Check
Are students continuing to struggle with comparing and ordering whole numbers through millions?

During Small Group Instruction

If Yes
- AL Daily Transparencies
- AL Differentiated Instruction Option 2 (p. 17c)
- AL Strategic Intervention Guide (pp. T6–T7)

If No
- OL Differentiated Instruction Option 2 (p. 17c)
- OL Skills Practice Worksheet
- BL Enrich Worksheet
Objective
Use the four-step plan to solve a problem.

Resources
Materials: poster board
Hands-On Activity Tools and Resources (p. 22)
Leveled Worksheets

Problem-Solving Investigation

TERESA: The table shows the prices, including tax, of the toys sold at Toy Central.

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yo-Yo</td>
<td>$4</td>
</tr>
<tr>
<td>Jump rope</td>
<td>$6</td>
</tr>
<tr>
<td>Bubbles</td>
<td>$2</td>
</tr>
</tbody>
</table>

I can spend exactly $10 on toys. Which of the following combinations of toys can I not buy?

- 2 yo-yos and 1 bubbles
- 3 bubbles and 1 yo-yo
- 1 jump rope and 3 bubbles

YOUR MISSION: Determine which combination of toys Teresa cannot buy.

Understand
You know she can spend $10 on toys and the prices of the toys. You need to determine which combination of toys she cannot buy.

Plan
You can solve the problem by finding the total cost of each combination of toys.

Solve
2 yo-yos and 1 bubbles: \((2 \times \$4) + (1 \times \$2)\) or \$10 ✓
3 bubbles and 1 yo-yo: \((3 \times \$2) + (1 \times \$4)\) or \$10 ✓
1 jump rope and 3 bubbles: \((1 \times \$6) + (3 \times \$2)\) or \$12
So, Teresa cannot buy 1 jump rope and 3 bubbles.

Check
Look back at the problem. The combination of 1 jump rope and 3 bubbles costs \$12. Since \$12 > \$10, the answer makes sense.

Common Error!
Exercise 2 Students may try to order numbers and forget to line up the place values. Remind students to line up the place values before comparing digits.
Describe a real-world situation in which it is helpful to compare and order numbers in the millions.

Sample answer: The revenue of large companies is often given using numbers into the millions. Comparing these numbers can help you understand the revenue of a particular business. You can then compare this company to others in the same industry before you decide to buy stock in that company.

PRACTICE
Using the Exercises
Exercises 1–10
The Exercises are structured so that students have the opportunity to use the four-step plan.

ASSESS
Formative Assessment
Tell students to use the four-step plan to solve the following problem.

The Missouri River is 2,540 miles long. The Mississippi River is 3,710 miles long and the Colorado River is 1,450 miles. Which river is longer? Mississippi River

Alternate Teaching Strategy
If students have trouble using the four-step plan to solve problems . . .

Then use one of these reteach options:

1. AL Reteach Worksheet

2. IWB Personal Tutor Have students use Personal Tutor to reteach the concept.

3. Use Small Groups Have them work in small groups to make posters showing the four steps of the four-step plan. Give each group a problem that they can use to illustrate the use of the plan. Hang the posters around the room until students become comfortable with using the four-step plan.

Stop and Reflect
Multi-Part Lesson 1 Describe a real-world situation in which it is helpful to compare and order numbers in the millions. Sample answer: The revenue of large companies is often given using numbers into the millions. Comparing these numbers can help you understand the revenue of a particular business. You can then compare this company to others in the same industry before you decide to buy stock in that company.

Write a problem that you can solve using the four-step plan. See Answer Appendix.
Focus on Math Background

Place value is 10 times the place value on its right. It is also true that a place value is \(\frac{1}{10}\) the place value on its left.

Help students avoid thinking of the decimal point as the “center” of the place value system. The ones place is the true center, as the place names have a kind of symmetry about the ones:

- digits: thousand, hundred, ten, one, tenth
- decimal: thousandths, hundredths, tenth

Essential Question

How is understanding the place value of numbers that represent parts of a whole (decimals) similar to understanding the place value of whole numbers?  
Sample answer: The place value of whole numbers and decimals is greater as you move to the left and the value increases by multiples of ten.

### Suggested Pacing (10 Days)

<table>
<thead>
<tr>
<th>Multi-Part Lessons</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Assess</th>
</tr>
</thead>
<tbody>
<tr>
<td>PART</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
</tr>
<tr>
<td>Days</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Mid-Chapter Check (p. 39)

**Title/Objective**

**PART C**

*Place Value Through Millionths* (pp. 31–34)

Read and write decimals in standard form, expanded form, and word form.

**PART D**

*Compare Decimals* (pp. 35–38)

Compare decimals.

**Standards**

GLE 0506.2.1

**Vocabulary**

equivalent decimals

Visual Vocabulary Card 18

**Materials/Manipulatives**

WorkMat 4: Place-Value Chart

**Resources**

✔ 0506.1.9

- Leveled Worksheets
- Daily Transparencies
- Problem of the Day
- Self-Check Quiz
- Personal Tutor
- Hands-On Activity Tools and Resources
Differentiated Instruction

Applying Level

Option 1
Use with 2B

**Hands-On Activity**

**Materials:** poster board

- Create a classroom place-value chart to reference when solving the problems and activities in this lesson.
- Make the chart adaptable for whole numbers and decimals.
- Students can make their own foldable version of the chart below to keep in their folders.

<table>
<thead>
<tr>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
<th>Thousandths</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Option 2
Use after 2A

**Hands-On Activity**

**Materials:** metric rulers, meter sticks, number lines

- Show students how rulers are similar to number lines. Compare a number line that models tenths to a ruler which measures millimeters and centimeters.
- Tell students to divide a number line into ten equal parts every time they model a decimal in tenths.
- Demonstrate how to model 0.7 on the number line.
- Ask students to use the metric rulers to find 0.7 of a centimeter.
- The activity can be extended to hundredths using a meter stick and a large demonstration-sized number line.

Other Options

**Learning Station Card 4**

- Personal Tutor, Lesson Animations, Virtual Manipulatives, eGames: *Blip’s Satellite Service*

On Level

Option 1
Use after 2B

**Hands-On Activity**

**Materials:** pencil, index cards

- Have students write a fraction or a decimal on one side of an index card.
- Have them switch cards with their partners and write the fraction as a decimal or write the decimal as a fraction. Then ask them to draw a model of the decimal or fraction.

**Option 2**
Use after 2D

**Hands-On Activity**

**Materials:** 40 index cards, each labeled with a decimal number

- Have students play “Dueling Decimals.”
- Students deal the cards facedown. Each student turns a card over and places it in the center of the table.
- The student with the greatest number wins the cards in the center. The game continues until one person has won all of the cards.

Other Options

**Learning Station Card 4**

- Personal Tutor, Lesson Animations, Virtual Manipulatives, eGames: *Blip’s Satellite Service*
Option 1  Use with 2C

**Hands-On Activity**

**Materials:** highlighter, calculator

- Ask students to highlight the zeros in the following numbers:
  48.500      597.610      1.078
- If you rewrite the first number as 48.5, does the value change? no
- If you rewrite the second number as 597.61, does the value change? no
- If you rewrite the third number as 1.78, does the value change? yes
- Next, have students use a calculator and input each original number. Check to see that the answers agree.
- What can you conclude? Zeros at the end of a decimal can be eliminated just as a calculator automatically does it. But zeros in whole numbers or within a decimal must remain.

Option 2  Use after 2C

**Hands-On Activity**

**Materials:** paper, pencils, number cards 0–9

- Have students select five cards from a deck and arrange them so there is a digit in the tens, ones, tenths, hundredths, and thousandths place.
- Using a place-value chart, have students arrange the five cards they selected into as many different numbers as they can and record the digits for each number in their charts.

<table>
<thead>
<tr>
<th>thousands</th>
<th>hundreds</th>
<th>tens</th>
<th>ones</th>
<th>tenths</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 0 1</td>
<td>5 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other Options

**Learning Station Cards 4, 6**

**Get Connect ED Lesson Animations, eGames:**

*Blip’s Satellite Service*

---

**Beyond Level**

**Option 1**  Use with 2C

**English Language Learners**

This strategy helps English Learners learn how to talk about decimals.

Find **Core Vocabulary** and **Common Use Verbs** in the online EL strategies to help students grasp the math skills; use **Language Alerts** at point of use in the Teacher Edition.

**Beginning**

**Activate Prior Knowledge** Count money and correctly use decimal points.

- Say any sentence and write it on the board. Point to the period. Elicit that the purpose for the period is to stop the sentence.
- Write $7.35 and then point to the decimal point. Say, *This decimal point stops the dollars and then the cents begin.*
- Say, *decimal point* and have students repeat.
- Ask a student to take and count a handful of coins. When they reach 100 cents, have them change it to $1.00.

**Intermediate**

**Activate Prior Knowledge** Use decimals when talking about measurement.

- Have students use a ruler and determine how many centimeters equal one inch. (2.54 cm = 1 in.)
- Write 2.54 on the board. Ask the following questions, and have students answer: *How do you say this number? Is it a whole number or a decimal number? What number is in the ones place? The tenths place? The hundredths place?*
- Repeat this activity with other numbers. Have students ask each other the same types of questions.

**Advanced**

**Writing and Speaking** Use vocabulary to talk about and write decimal numbers.

- Assign a list of classroom objects for students to measure in centimeters.
- Have students work with a partner to measure the objects and record the measurements on a chart.
- Finally, have students report to the class and compare their measurements. Make sure they are using the place value names correctly.

**Extend**

Have students work with manipulating numbers on a place value mat to practice saying each complete decimal number and to practice the names of each place value.
**Fractions and Decimals**

**Objective**
Use models to relate decimals to fractions.

**Vocabulary**
decimal, decimal point

**Resources**
**Materials:** tenths grid, WorkMat 5: Hundredths Model
**Hands-On Activity Tools and Resources** (p. 68)

**INTRODUCE**

**Introduce the Concept**
- Show a tenths grid on the overhead. **How many equal-sized squares are in the grid?** 10
- If the whole grid represents 1, how much does each rectangle represent? **1 tenth**
- Shade 3 rectangles on the grid. **How many rectangles are shaded?** 3
- What decimal does the shaded part of the grid represent? **0.3**

**TEACH**

**Activity 1** Make sure students understand that the whole grid represents 1 and one column represents one tenth. Point out that when 1 rectangle is shaded, the model shows 1 out of 10, 1 tenth, or 0.1.

**ELL Language Alert!**
Pronunciation of /th/ Pronunciation of the words tenths and hundredths may be difficult for English learners because /th/ does not exist in many languages. Allow students time to practice these new sounds.

**Fractions and Decimals**

Fractions and decimals are related. In a place-value chart, the place to the right of the ones place has a value of \( \frac{1}{10} \) or one tenth. The next place value has a value of \( \frac{1}{100} \) or one hundredth. Numbers that have digits in the tenths place, hundredths place, and beyond are called **decimals**. A **decimal point** is used to separate the ones place from the tenths place.

**Get Connected**

**Explore**

**Main Idea**
I will use models to relate decimals to fractions.

**Vocabulary**
decimal, decimal point

**Fraction** | **Words** | **Decimal** | **Model**
--- | --- | --- | ---
\( \frac{1}{10} \) | one tenth | 0.1 | ![](chart)

**Activity**
Use a model to show \( \frac{3}{10} \). Then write it in words and as a decimal.

**Step 1** Shade 3 rows in the grid.

**Step 2** The model shows three tenths or 0.3.

**Building Math Vocabulary**

Have students show an example of a fraction and a decimal. Then have them use the vocabulary words and their definitions in a sentence to describe their example.

**Visual Vocabulary Cards**

Use Visual Vocabulary Cards to reinforce the vocabulary introduced in this lesson in English and Spanish. (The Define/Example/Ask routine is printed on the back of each card.)
Lesson 2A
Decimals

Think About It

1. The model at the right shows a thousandths cube. What fraction of the model is shaded? Then write as a decimal. \( \frac{4}{1,000} \); 0.004

2. Model \( \frac{80}{100} \). Then name the fraction as a decimal in two different ways. See margin.

Practice and Apply It

Use a model to write each fraction in words and as a decimal. 3–6. See margin.

3. \( \frac{7}{10} \); seven tenths; 0.7

4. \( \frac{9}{10} \); nine tenths; 0.9

5. \( \frac{5}{100} \); five hundredths; 0.05

6. \( \frac{63}{100} \); sixty-three hundredths; 0.63

7. 0.17; \( \frac{17}{100} \)

8. 0.89; \( \frac{89}{100} \)

9. 0.68; \( \frac{68}{100} \)

10. WRITE MATH Explain why \( \frac{45}{100} \) is written as a decimal with a 4 in the tenths place and a 5 in the hundredths place. Sample answer: Forty-five hundredths is the same as four tenths plus five hundredths.

ASSESS

Formative Assessment

Use the Practice and Apply It Exercises to assess whether students understand how to use models to represent decimal place value.

From Concrete to Abstract Exercises 7–9 bridge the gap between using a model to show a fraction and writing the decimal that is shown in a model.

For more practice of the concepts presented in this Explore lesson, see Explore Worksheet.

Additional Answers

2. \( \frac{80}{100} \); eighty hundredths

3. \( \frac{7}{10} \); seven tenths; 0.7

4. \( \frac{9}{10} \); nine tenths; 0.9

5. \( \frac{5}{100} \); five hundredths; 0.05

6. \( \frac{63}{100} \); sixty-three hundredths; 0.63

ELL Language Alert!

Decimals and Commas Be aware that the placement of a decimal and a comma in a number may differ from country to country. For example, the number 1,422.65 is written as 1.422,65 in Indonesia.
**Objectives**
Represent fractions that name tenths, hundredths, and thousandths as decimals.

**Resources**
- Materials: index cards
- Leveled Worksheets

**Activity Choice 1: Hands-On**
- **Distribute play money to students.** How many pennies are in one dollar? 100
- **What fractional part of one dollar is a penny?** \( \frac{1}{100} \)
- **Use a decimal to write one penny as a fractional part of a dollar.** $0.01
- **What fractional part of one dollar is a dime?** \( \frac{10}{100} \) or \( \frac{1}{10} \)
- **Use a decimal to write one dime as a fractional part of a dollar.** $0.10

**Activity Choice 2: Critical Thinking**
There has been an on-going debate about whether or not the penny should be a discontinued form of currency. This would leave the nickel as the lowest denomination of currency.
- **Introduce this idea to students.**
- **Discuss the pros and cons of eliminating pennies.**
- **Discuss how this change would affect the decimal representation of amounts of money.**
- **Ask students to form an opinion based on the discussion and have students write an explanation of their view in their Math Journals.**

**Building Math Vocabulary**
- Have students play a matching game with fractions and decimals. Using index cards, create a set of 10 fraction cards with denominators of 10, 100, and 1,000. Create a second set of 10 decimal cards with equivalent values to the fraction cards. Allow students to work in pairs or small groups to match the cards.
Lesson 2B

Decimals

1. Use a model to write each fraction as a decimal. See Examples 1, 2

1. \( \frac{4}{10} = 0.4 \)

2. \( \frac{2}{10} = 0.2 \)

3. \( \frac{58}{100} = 0.58 \)

4. \( \frac{74}{100} = 0.74 \)

5. \( \frac{6}{100} = 0.06 \)

6. \( \frac{5}{100} = 0.05 \)

7. \( \frac{795}{1000} = 0.795 \)

8. \( \frac{9}{1000} = 0.009 \)

9. In a class survey, \( \frac{60}{100} \) students said that they have a pet. Write this result as a decimal. 0.60 or 0.6

10. Describe a rule for writing fractions like \( \frac{8}{100} \) and \( \frac{32}{1000} \) as decimals. To write decimals, insert a zero after the decimal point so the number of digits is correct.

2. Scaffolding Questions

- Draw a tenths model. Shade 3 equal parts of the grid.
  - How many columns are shaded? 3
  - What fraction does this model show? \( \frac{3}{10} \)
  - What decimal does this model show? 0.3

- Draw a hundredths model. Shade 23 equal parts of the grid.
  - How many squares are shaded? 23
  - What fraction does this model show? \( \frac{23}{100} \)
  - What decimal does this model show? 0.23

3. Additional Examples

1. Write \( \frac{73}{100} \) as a decimal. 0.73

2. The students in Mr. Marquez’s class represent \( \frac{36}{1000} \) of the school. Represent this fraction as a decimal. 0.036

4. Use a Number Line

- On a transparency or chalkboard, draw a number line divided into tenths beginning with 1 and ending with 2. Label the tick marks for 1.2, 1.5, and 1.9.
- Have students copy the number line on a piece of paper.
- Where on your number line would you find 1.1? between 1 and 1.2
- Have students write 1.1 on their number lines as you write it on the class number line.
- What other numbers are missing? 1.3, 1.4, 1.5, 1.6, 1.7, 1.8
- As a class, discuss how to use a number line to represent decimal numbers.

5. Alternate Teaching Strategy

- If students have trouble understanding the meaning of tenths and hundredths...
- Then use one of these reteach options:

  1. Reteach Worksheet
  2. Virtual Manipulatives Use WorkMat 4: Place-Value Chart to reteach the concept.
  3. Use a Number Line On a transparency or chalkboard, draw a number line divided into tenths beginning with 1 and ending with 2. Label the tick marks for 1.2, 1.5, and 1.9.
    - Have students copy the number line on a piece of paper.
    - Where on your number line would you find 1.1? between 1 and 1.2
    - Have students write 1.1 on their number lines as you write it on the class number line.
    - What other numbers are missing? 1.3, 1.4, 1.5, 1.6, 1.7, 1.8
    - As a class, discuss how to use a number line to represent decimal numbers.

Lesson 2B Decimals 29
Differentiate practice using these leveled assignments for the exercises in Practice and Problem Solving.

<table>
<thead>
<tr>
<th>Level</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL Approaching Level</td>
<td>11–16, 23–24, 27–28, 31–33</td>
</tr>
<tr>
<td>OL On Level</td>
<td>11–29 odd, 31–33</td>
</tr>
<tr>
<td>BL Beyond Level</td>
<td>11–29 odd, 31–33</td>
</tr>
</tbody>
</table>

H.O.T. Problems: Have students discuss and complete the Higher Order Thinking exercises. Encourage them to use 10-by-10 grids or place-value charts to help them solve the exercises.

WRITE MATH: Have students complete the Write Math Exercise in their Math Journals. You may choose to use this exercise as an optional formative assessment.

**4 ASSESS**

**Formative Assessment**

Present the following problem to students:

A one-thousandths cube has 81 small cubes shaded. What fraction and decimal represents the shaded part? \( \frac{81}{1,000} \) = 0.081

**Quick Check**

Are students continuing to struggle with representing decimals?

During Small Group Instruction

If Yes → AL Daily Transparencies
AL Differentiated Instruction Option 1 (p. 26c)
AL Strategic Intervention Guide (pp. T20–T21)

If No → OL Differentiated Instruction Option 1 (p. 26c)
OL Skills Practice Worksheet
OL Enrich Worksheet

**INTO THE Future**

Tell students that the next lesson is about place value through millionths. Ask students to write how they think today’s lesson on representing fractions as decimals will help them with the next lesson.

**Practice and Problem Solving**

Use a model to write each fraction as a decimal. See Examples 1, 2

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Fraction</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>( \frac{3}{10} )</td>
<td>0.3</td>
</tr>
<tr>
<td>12.</td>
<td>( \frac{9}{10} )</td>
<td>0.9</td>
</tr>
<tr>
<td>13.</td>
<td>( \frac{86}{100} )</td>
<td>0.86</td>
</tr>
<tr>
<td>14.</td>
<td>( \frac{99}{100} )</td>
<td>0.99</td>
</tr>
<tr>
<td>15.</td>
<td>( \frac{107}{1,000} )</td>
<td>0.107</td>
</tr>
<tr>
<td>16.</td>
<td>( \frac{587}{1,000} )</td>
<td>0.587</td>
</tr>
<tr>
<td>17.</td>
<td>( \frac{51}{1,000} )</td>
<td>0.051</td>
</tr>
<tr>
<td>18.</td>
<td>( \frac{80}{1,000} )</td>
<td>0.080</td>
</tr>
<tr>
<td>19.</td>
<td>( \frac{60}{100} )</td>
<td>0.60</td>
</tr>
<tr>
<td>20.</td>
<td>( \frac{22}{1,000} )</td>
<td>0.022</td>
</tr>
<tr>
<td>21.</td>
<td>( \frac{4}{100} )</td>
<td>0.04</td>
</tr>
<tr>
<td>22.</td>
<td>( \frac{1}{1,000} )</td>
<td>0.001</td>
</tr>
</tbody>
</table>

23. Mrs. Carroll bought \( \frac{8}{10} \) pound of turkey. Write this fraction as a decimal. 0.8

24. A runner decreased his time by \( \frac{5}{100} \) of a second. Express this decrease as a decimal. 0.05

25. About \( \frac{7}{10} \) of a person’s body weight is water. Write this fraction as a decimal. 0.7

26. It rains only 9 hundredths of an inch each year in Ica, Peru. Write this number as a decimal. 0.09

**Measurement** Write the customary measure for each metric measure as a decimal.

27. 1 kilometer = 0.62 mi
28. 1 millimeter = 0.04 in.
29. 1 gram = 0.035 oz
30. 1 liter = 0.908 qt

<table>
<thead>
<tr>
<th>Metric Measure</th>
<th>Customary Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 kilometer</td>
<td>0.62 mile</td>
</tr>
<tr>
<td>1 millimeter</td>
<td>0.04 inch</td>
</tr>
<tr>
<td>1 gram</td>
<td>0.035 ounce</td>
</tr>
<tr>
<td>1 liter</td>
<td>0.908 quart</td>
</tr>
</tbody>
</table>

**H.O.T. Problems**

31. OPEN ENDED Write a fraction that has a denominator of 100. Then write the fraction as a decimal and draw a model to represent the decimal. Sample answer: \( \frac{75}{100} = 0.75 \). See Answer Appendix for model.

32. FIND THE ERROR Dylan is writing \( \frac{95}{1,000} \) as a decimal. Find his mistake and correct it. He wrote \( \frac{950}{1,000} \) as a decimal. The decimal should be 0.095.

33. WRITE MATH Explain how the word form of a fraction can help you write the fraction as a decimal. See Answer Appendix.

**Exercise 22** Students may insert only one zero when writing this decimal. If this happens, have students read their incorrectly written decimal back to you. Then ask them if that is the same as the fraction shown in the exercise.

**COMMON ERROR!**

Tell students that the next lesson is about place value through millionths. Ask students to write how they think today’s lesson on representing fractions as decimals will help them with the next lesson.

**30 Place Value**
In 2008, Britta Steffen of the United States set an Olympic record. She swam the 100-meter freestyle in 53.12 seconds.

You can read the time as:
• fifty-three and twelve hundredths seconds
You can write the time as:
• $53 \text{ and } 12 \text{ hundredths}$ seconds

You have seen that the place-value chart used for whole numbers can be extended to include decimals like 53.12. The decimal point separates the ones place and the tenths place.

### Place-Value Chart

<table>
<thead>
<tr>
<th>Place</th>
<th>5</th>
<th>3</th>
<th>1</th>
<th>2</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>tens</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ones</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tenths</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hundredths</td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>thousandths</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

The digit 1 is in the tenths place. Its value is 0.1.
The digit 2 is in the hundredths place. Its value is 0.02.

Just as with whole numbers, you can also write decimals in standard form and expanded form.

### Activity Choice 1: Hands-On

Draw the following on the board:

\_
\_
\_
\_
\_
\_
\_
\_

Have students copy the diagram and fill in the following:

- Write 3 in the tens place.
- Write 0 in the thousands place.
- Write 8 in the ones place.
- Write 2 in the millions place.
- Write 7 in the ten thousands place.
- Write 5 in the ten millions place.
- Write 2 in the hundreds place.
- Write 1 in the hundred millions place.
- Write 6 in the hundred thousands place.

What is the number? **152,670,238**

### Activity Choice 2: Graphic Organizer

- Provide students with a Venn diagram.
- Ask students to compare whole numbers to decimals using the Venn diagram.
- Encourage students to focus on naming conventions, such as thousands versus thousandths, and place value.

### Building Math Vocabulary

Provide students with number riddles like the one below.

**Name a number with a 5 in the tens place, a 9 in the tenths place, and a 0 in the ones place.** Sample answer: **50.9**

The riddles should focus on the vocabulary related to place value. Stress the differences between words such as, “hundreds” and “hundredths.” Allow students to work in pairs to solve the riddle. For struggling students, provide a place-value chart and allow students to use number tiles to fill in the chart.
### Scaffolding Questions

Draw a place-value chart on the board from tens through thousandths. Write the number 23.145 in the chart.

- What digit is in the tenths place? 1
- What digit is in the hundredths place? 4
- What place is the 5 in? thousandths
- What is the value of the 5? 0.005

### Additional Examples

1. Write the place value and the value of the underlined digit in 0.615. **hundredths place; value is 0.01**
2. Write 1 and 27 hundredths in standard form and expanded form. **1.27; 1 + 0.2 + 0.07**
3. Elyse needs 4.25 cups of flour for the cake she is baking. Write the number of cups in word form. **four and twenty-five hundredths**
4. Robots Scientists use robot-assisted workstations to measure in microns. One micron is equal to one millionth of a meter. The number of meters which is represented by 24 microns is 0.000024 of a meter. Read and write this number in word form. **twenty-four millionths**

### Additional Answers

5. **10 + 9 + 0.4; nineteen and four-tenths**
6. **30 + 5 + 0.1 + 0.09; thirty-five and nineteen hundredths**
7. **1 + 0.6 + 0.008; one and six hundred eight thousandths**
8. **7 + 0.0004 + 0.00008 + 0.000005; seven and four hundred eighty-five millionths**
9. **Sample answer: Say the number to the right of the decimal point and the name of the place value of the last digit.**

### REAL-WORLD EXAMPLE

**Measurement** Five tree taps produce enough maple sap to make 1 gallon, or about 3.79 liters, of syrup. Read and write the number of liters in word form.

<table>
<thead>
<tr>
<th>tens</th>
<th>ones</th>
<th>tenths</th>
<th>hundredths</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>7</td>
<td>9</td>
</tr>
</tbody>
</table>

The place value of the last digit, 9, is hundredths.
**Word form:** three and seventy-nine hundredths

**Measurement** The thickness of a piece of hair is about 0.000017 of a meter. Read and write the number of meters in word form.

<table>
<thead>
<tr>
<th>one</th>
<th>tenths</th>
<th>hundredths</th>
<th>thousandths</th>
<th>ten-thousandths</th>
<th>hundred-thousandths</th>
<th>millionths</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>

The place value of the last digit, 7, is millionths.
**Word form:** seventeen millionths
Name the place of the underlined digit. Then write the value of the digit. See Example 1
1. 6.14 tenths; 0.1
2. 4.036219 millionths; 0.000009

Write each number in standard form. See Example 2
3. 5 and 87 hundredths 5.87
4. 20 + 6 + 0.9 + 0.01 + 0.004 26.914

Write each number in expanded form. Then read and write in word form. See Examples 2–4 5–8. See margin.
5. 19.4
6. 35.19
7. 1.608
8. 7.000485
9. A spider can travel one and two tenths miles per hour. Write this as a decimal. 1.2 miles per hour
10. Discuss how place value is used to read decimals. See margin.

Practice and Problem Solving
Name the place of the underlined digit. Then write the value of the digit. See Example 1
11. 63.47 hundredths; 0.07
12. 9.56 tenths; 0.5
13. 4.072378 thousandths; 0.002
14. 81.453062 millionths; 0.000002

Write each number in standard form. See Example 2
15. 13 and 9 tenths 13.9
16. fifty and six hundredths 50.06
17. 10 + 1 + 0.9 + 0.02 + 0.003 11.923
18. 7 + 0.1 + 0.005 7.105

Write each number in expanded form. Then read and write in word form. See Examples 2–4 19–26. See margin.
19. 4.28
20. 0.917
21. 69.409
22. 20.05
23. 13.09
24. 0.25
25. 92.301997
26. 2.047631

27. An athlete completes a race in 57.505 seconds. Name all the places the digit 5 appears in the number. tens, tenths, thousandths
28. There were three and five hundredths inches of rain yesterday. Write this number in standard form. 3.05
29. A baseball player had a batting average of 0.334 for the season. Write this number in expanded form. 0.3 + 0.03 + 0.004
30. The table shows the amount of salt that remains when a cubic foot of water evaporates. Read each number that describes the amount of salt. Then write each number in words. two and two tenths pounds; one hundredth pound

Salt Comparison
Source of Water
Atlantic Ocean 2.2 pounds
Lake Michigan 0.01 pound

As a class, have students complete the Check What You Know Exercises as you observe their work.

**TALK MATH** Use the Talk Math Exercise to assess student comprehension before assigning the practice exercises.

**Alternate Teaching Strategy**
If students have trouble with place value through thousandths . . . Then use one of these reteach options:

1. **AL** Reteach Worksheet
2. **IWB** Personal Tutor Have students use Personal Tutor to reteach the concept.
3. **Use a Place Value-Charts** Have students write the number 12.345 in a place-value chart. Then have them write the number as an addition expression in horizontal form: 10 + 2 + 0.3 + 0.04 + 0.005

**PRACTICE**
Differentiate practice using these leveled assignments for the exercises in Practice and Problem Solving:

<table>
<thead>
<tr>
<th>Level</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AL</strong> Approaching Level</td>
<td>11–12, 15–16, 19–22, 27–28, 31–38</td>
</tr>
<tr>
<td><strong>OL</strong> On Level</td>
<td>11–29 odd, 31–38</td>
</tr>
<tr>
<td><strong>BL</strong> Beyond Level</td>
<td>12–30 even, 31–38</td>
</tr>
</tbody>
</table>

**H.O.T. Problems** Have students discuss and complete the Higher Order Thinking exercises. Encourage students to use place-value charts to help them solve these problems.

**WRITE MATH** Have students complete the Write Math Exercise in their Math Journals. You may choose to use this as an optional formative assessment.

**COMMON ERROR!**
*Exercise 16* Student may write this number as 50.6 instead of 50.06. Encourage students to read their answers after they have written them in standard form to make sure that they have written the correct number.
Formative Assessment

Have students write 19.023 in expanded form and word form. \(10 + 9 + 0.02 + 0.003\); nineteen and twenty-three thousandths

Quick Check

Are students continuing to struggle with place value through millionths?

During Small Group Instruction

If Yes → AL Daily Transparencies
AL Strategic Intervention Guide (p. T119)
If No → BL Differentiated Instruction Options 1 and 2 (p. 26d)
OL Skills Practice Worksheet
BL Enrich Worksheet

Test Practice exercises help students solidify their knowledge using exercises in a format similar to standardized tests.

More About

Tell students that they can use place value to write a decimal as a fraction.
- Using a place value chart, write the decimal 0.85.
- Have students read and write the decimal. 0.85 is eighty-five hundredths
- Guide students in understanding that 0.85 \(=\) eighty-five hundredths \(=\) \(\frac{85}{100}\). Explain that \(\frac{85}{100}\) can be simplified as \(\frac{17}{20}\).
- Work the Examples as a class.
- Assign the exercises.

More About

Write Decimals as Fractions

To write a decimal as a fraction, use place value.

Write each decimal as a fraction in simplest form.

1. 0.7
   \[0.7 = \frac{7}{10}\] Say seven tenths.
2. 0.014
   \[0.014 = \frac{14}{1000}\] Say fourteen thousandths.
   \[= \frac{7}{500}\] Simplify.

Write each decimal as a fraction in simplest form.

36. 0.08 \(=\) \(\frac{2}{25}\)
37. 0.24 \(=\) \(\frac{6}{25}\)
38. 0.005 \(=\) \(\frac{1}{200}\)

Additional Answer

32. 5 and 39 tenths; The other choices represent 5 and 39 hundredths.

Yesterday’s News

Have students explain how yesterday’s lesson on representing fractions that name tenths, hundredths, and thousandths as decimals helped them with today’s lesson on place value through millionths.
Compare Decimals

Comparing decimals is similar to comparing whole numbers.

**Main Idea**

I will compare decimals.

**Vocabulary**

equivalent decimals

**REAL-WORLD EXAMPLE**

**MUSIC** Luis downloaded two songs onto his MP3 player. Which song is longer?

<table>
<thead>
<tr>
<th>Song</th>
<th>Length (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>2</td>
<td>3.8</td>
</tr>
</tbody>
</table>

**One Way:** Use a number line.

- Numbers to the right are greater than numbers to the left. Since 3.8 is to the right of 3.6; 3.8 > 3.6.

**Another Way:** Use place value.

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line up the decimal points.</td>
<td>Compare the digits in the greatest place.</td>
<td>Continue comparing until the digits are different.</td>
</tr>
<tr>
<td>3.6</td>
<td>3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
</tr>
<tr>
<td>The ones digit are the same.</td>
<td>In the tenths place, 6 &lt; 8. So, 3.6 &lt; 3.8.</td>
<td></td>
</tr>
</tbody>
</table>

So, Song 2 is longer.

**Building Math Vocabulary**

Write equivalent decimals and its definition on the board.

Ask students if they see a familiar word within the term “equivalent.” Explain that its prefix equi- means “equal.” Have students make a list of all the words they can think of that have the prefix equi-. Then have students write a sentence using the vocabulary word and its definition.

**Visual Vocabulary Cards**

Use Visual Vocabulary Cards to reinforce the vocabulary introduced in this lesson in English and Spanish. (The Define/Example/Ask routine is printed on the back of each card.)

**Objective**

Compare decimals.

**Vocabulary**

equivalent decimals

**Resources**

**Materials:** WorkMat 4: Place-Value Chart, WorkMat 5: Hundredths Model

**Hands-On Activity Tools and Resources (pp. 67–68)**

- Leveled Worksheets

**Activity Choice 1: Hands-On**

- Give students two 10-by-10 grids. Have students label one grid A and the other B. Tell them to shade 43 squares in grid A and 62 squares in grid B. Draw the same grids on the board.

- How many squares are shaded in grid A? 43
- What decimal does this model show? 0.43
- How many squares are shaded in grid B? 62
- What decimal does this model show? 0.62
- Which number is greater? 0.62 How do you know? Sample answer: Its grid has more squares shaded.

**Activity Choice 2: Math Tool Chest**

- Have students select the Money tool in the Math Tool Chest. Instruct them to click on Level 2 and then select the Two-Part Mat Type.
- Ask students to compare decimals using the stamps. Students should notice that the decimal amount shown in the lower left side changes as they stamp each dollar or coin.
- Provide students with a list of dollar amounts to compare, such as $1.07 and $7.01. Students can stamp the correct currency into each section of the mat.
- Finally, have students compare the numbers shown in the two sections of the mat, as well as the currency that they have stamped out in each section.
**2 TEACH**

**Scaffolding Questions**

Draw a number line on the board from 0 to 1. Label 0, 0.1, 0.2, 0.3, ..., 0.9, 1.0.
- Label 0.2 as point A and 1.0 as point B.
- Compare point A to point B. Which number is greater? 1.0
- How can you write that 1.0 is greater than 0.2? 1.0 > 0.2
- How does a number line help you see which number is greater? Sample answer: Numbers to the right are greater than numbers to the left.

**ADDITIONAL EXAMPLES**

1. Roano ran 1.68 miles. Wangari ran 1.50 miles. Who ran the longer distance? Roano
2. Replace with <, >, or = to make 0.730 < 0.73 a true sentence. =
3. Replace with <, >, or = to make 0.8 < 0.87 a true sentence. <

As a class, have students complete the Check What You Know Exercises as you observe their work.

**Talk Math** Use the Talk Math Exercise to assess student comprehension before assigning the practice exercises.

**Alternate Teaching Strategy**

- If students have trouble comparing decimals...
  - Then use one of these reteach options:
    - 1. **AL** Reteach Worksheet
    - 2. **IWB** Personal Tutor Have students use Personal Tutor to reteach the concept.
    - 3. **Use a WorkMat** Have students use WorkMat 4: Place-Value Chart. Ask them to record 12.35 and 1.235 on their charts. Then ask them to circle the digit in the greatest place for each decimal.
      - Have them write two inequalities that can be used to compare these two numbers. 12.35 > 1.235 or 1.235 < 12.35

---

**Check What You Know**

Replace each with <, >, or = to make a true sentence. See Examples 1–3

1. 0.5 < 0.7
2. 0.62 > 0.26
3. 3.7 = 3.70
4. 4.40 = 4.44
5. 0.003 < 0.102
6. 9.624 > 9.618
7. 0.03462 = 0.034620
8. 9.712361 < 9.712631
9. 6.500 > 6.5

10. Each year, Wadis Halfa, Sudan, gets about 2.5 millimeters of rain, and Luxar, Egypt, gets about 0.76 millimeter of rain. Which place gets more rain each year? Wadis Halfa

11. **Talk Math** Describe how you know if two decimals are equivalent. See margin.

**Additional Answer**

11. Sample answer: If all the digits in both decimals are the same except for the zeros at the end, then the decimals are equivalent.
Replace each \( \_ \) with \(<\), \(>\), or \(=\) to make a true sentence. See Examples 1–3

12. \( 4.4 \_ 4.1 \)
13. \( 0.39 \_ 0.37 \)
14. \( 0.57 \_ 0.65 \)
15. \( 2.15 \_ 2.150 \)
16. \( 0.1 \_ 0.006 \)
17. \( 0.652 \_ 0.647 \)
18. \( 0.09 \_ 0.01 \)
19. \( 7.304 \_ 7.30 \)
20. \( 2.800 \_ 2.8 \)
21. \( 0.000657 \_ 0.000066 \)
22. \( 0.09109 \_ 0.00919 \)
23. \( 5.005 \_ 5.0005 \)
24. A cat’s normal body temperature is 101.5 degrees Fahrenheit. A rabbit’s normal body temperature is 103.1 degrees Fahrenheit. Which animal has a lower normal body temperature? **cat**

25. **Measurement** Gold leaf is used in decorating metals, woodwork, and even certain foods. One sheet of gold leaf is about 0.000004 inch thick. Is this greater than or less than the thickness of silver leaf, which is 0.000005 inch thick? **less than**

For Exercises 26–28, use the table at the right that shows the cost of posters of famous works of art.

26. Does the poster *Relativity* or the poster *Women and Bird in the Night* cost more? **Women and Bird in the Night**
27. Which poster costs less: *From the Lake, No. 1,* Georgia O’Keeffe or *Waterlilies,* Claude Monet? **Waterlilies**
28. Which poster costs less than *Waterlilies,* Claude Monet? **Relativity**

Use the information to solve the problem.

**Greenhouse Shopping Spree!**

Remember to compare by place value!

29. How does the price for FasGro soil compare to the price of Summer Green soil? \( $6.77 > $6.47 \)

**Checks for Understanding**

\( 0506.1.9 \) Use age-appropriate books, stories, and videos to convey ideas of mathematics. (See Exercise 29.)

**EXTRA PRACTICE**

Begins on page EP2.

Differentiate practice using these leveled assignments for the exercises in Practice and Problem Solving.

<table>
<thead>
<tr>
<th>Level</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A_L</td>
<td>Approaching Level</td>
</tr>
<tr>
<td>O_L</td>
<td>On Level</td>
</tr>
<tr>
<td>B_L</td>
<td>Beyond Level</td>
</tr>
</tbody>
</table>

**Animated Graphic Novel**

Rewatch “Greenhouse Shopping Spree!”

**TALK MATH** Have students discuss various strategies for comparing decimals, such as using a place-value chart.

**COMMON ERROR!**

Exercises 22 and 23 Students may see the same digits in the two numbers being compared and assume that the numbers are equivalent. Encourage students to line up the decimal points and then compare the digits.
HOT Problems Have students discuss and complete the Higher Order Thinking problems.

WRITE MATH Have students complete the Write Math Exercise in their Math Journals.

Formative Assessment
Ask students to write two inequalities that can be used to compare 4.58 and 4.058. 4.58 > 4.058; 4.058 < 4.58

Quick Check Are students continuing to struggle with comparing decimals?

During Small Group Instruction
If Yes AL Daily Transparencies
If No OL Differentiated Instruction Option 2 (p. 26c)
OL Skills Practice Worksheet
BL Enrich Worksheet

Spiral Review
Review and assess mastery of skills and concepts from the previous lessons in the chapter.

Additional Answers
30. 18.70, 18.700; They represent the same amount because adding zeros to the right of the number does not change the value of the number.
31. 100 times; the value of each place is 10 times the value of the place to its right. So, 46 is 10 times greater than 4.6 and 10 \times 10 or 100 times greater than 0.46.
32. Sample answer: In both cases, you can use a number line or place value to compare numbers. When comparing whole numbers, line up the digits and compare digits in the same place from left to right. When comparing decimals, line up the decimal points and compare digits in the same place from left to right.

33. Which of the following numbers is greater than 7.02? A
   A. 7.021
   B. 7.020
   C. 7.002
   D. 7.0

35. Which of the following lists three decimals between 8.6 and 9.2?  
   F. eight and seven tenths, 8.61, 8.5  
   G. eight and seven hundredths, 9.1, 9.0  
   H. eight and eight tenths, 9.21, 9.01  
   I. eight and seventy-five hundredths, 8.80, 9.19

34. **GRIDDED RESPONSE** What is the standard form for the following?  
   5 + 0.007 + 0.0002 \[ 5.0072 \]

36. Which of the following shows the correct order from least to greatest?  
   B. 0.225, 0.0225, 2.25  
   C. 0.225, 2.0225, 2.225  
   D. 2.25, 2.0225, 2.025

37. 0.85 0.8 + 0.05  
38. 2.09 2 + 0.09  
39. 5.074  
40. 16.731

41. The model at the right has \( \frac{6}{10} \) of its squares shaded. Write the decimal that is represented by the shaded portion. (Lesson 2B) 0.6

42. Della wants to score 32 goals this soccer season. So far, she has scored 26 goals and there are 3 games left this season. If she scores the same number of goals in each of the remaining games, how many goals must she score per game to score 32 goals? (Lesson 1C) 2 goals

STOP and REFLECT
Multi-Part Lesson 2 Why is the number zero important in place value? Sample answer: The number zero is often a place holder for a place value. For instance, in the number 152.03, the zero fills the tenths place. Without the zero, the number (152.3) would have an entirely different value.

Write the following on the board:  
0.004 \( \neq \) 0.04 \(<\)  
0.067 \( \neq \) 0.36 \(<\)  
Have students write \(<\), \(\neq\), or \(=\) to make the sentences true.
1. Name the place of the underlined digit. Then write the value of the digit. (Lesson 1A)
   1. 42,924,603
   2. 953,187
   3. MULTIPLE CHOICE In which number does 6 have a value of 60,000,000? (Lesson 1A)
      C. 1,862,940
      D. 564,103,278
      B. 16,743,295
      D. 693,751,842

4. Write the number of acres of Wrangell–St. Elias in expanded and word form.

5. Write in words how you would read the number of acres in Denali park.

Replace each ◊ with <, >, or = to make a true sentence. (Lesson 1B)
6. 84 ◊ 90
7. 542 ◊ 524
8. 925 ◊ 1,024
9. 6,132 ◊ 6,231

10. The attendance at Friday’s baseball game was 45,673. Sunday’s game attendance was 45,761. Which game had a greater attendance? (Lesson 1B)

11. A fifth-grade teacher has 24 students in class. She wants to give each student 3 pencils. If she has 56 pencils, how many more pencils does she need? (Lesson 1C)

12. MULTIPLE CHOICE Which decimal represents the shaded part of the figure? (Lesson 2B)
   A. 0.052
   C. 0.52
   B. 0.492
   D. 0.039

17. Write four millionths as a decimal. (Lesson 2C)
   A. 0.000004

18. WRITE MATH Explain how to compare the decimals 6.008 and 6.041. (Lesson 2D)

Data-Driven Decision Making
Based on the results of the Mid-Chapter Check, use the following resources to review concepts that continue to give students problems.

<table>
<thead>
<tr>
<th>Exercises</th>
<th>Tennessee Standards</th>
<th>What’s the Math?</th>
<th>Error Analysis</th>
<th>Resources for Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–5</td>
<td>GLE 0506.2.1</td>
<td>Use place value to represent whole numbers to 999,999,999.</td>
<td>Does not write numbers in correct spaces. Does not know how to write in expanded form. Does not write number in words correctly.</td>
<td>Chapter Resource Masters</td>
</tr>
<tr>
<td>6–10</td>
<td>GLE 0506.2.1</td>
<td>Compare whole numbers using greater than or less than signs.</td>
<td>Reverses “greater than” and “less than” symbols.</td>
<td>Lesson Animations • Personal Tutor • Self-Check Quiz</td>
</tr>
<tr>
<td>12–17</td>
<td>GLE 0506.2.1</td>
<td>Write numbers as fractions or decimals.</td>
<td>Does not put decimal point in correct spot, or know how to write fraction as a decimal. Does not read numbers accurately.</td>
<td></td>
</tr>
</tbody>
</table>
How is comparing whole numbers similar to comparing decimals? Sample answer: You use place value to determine the value of numbers, whether they are whole numbers or decimals.

Ordering a set of numbers is a series of comparisons of two numbers. When place value is used to order whole numbers, the numbers are aligned on the right. This assures that digits of the same place are being compared.

When ordering decimals, the decimal points should be aligned so that digits of the same place are being compared. It is often helpful to annex zeros so that each decimal that is being ordered has the same number of decimal places. Students should be reminded that the practice exercises may ask them to order groups of numbers from least to greatest or greatest to least.

Essential Question
How is comparing whole numbers similar to comparing decimals? Sample answer: You use place value to determine the value of numbers, whether they are whole numbers or decimals.

Focus on Math Background
Ordering a set of numbers is a series of comparisons of two numbers. When place value is used to order whole numbers, the numbers are aligned on the right. This assures that digits of the same place are being compared.

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**Differentiated Instruction**

**Approaching Level**

**Option 1**

**Materials:** paper, pencils, spinners labeled 0–9

- Give each student a spinner.
- Have students spin the spinner 3 times. They should write the digits on a separate sheet of paper and arrange the digits to form a number with one decimal place.
- Repeat the process to generate two or three numbers.
- Then have students compare their numbers and write the numbers in order from least to greatest.

**Beyond Level**

**Option 1**

**Materials:** paper and pencils

- Ask students to revisit the snake problem in Lesson 3A to find the growth from each baby length to its adult size. Have them draw a new column to show their results.
- Finally, ask them to order their results from least to greatest and write briefly about their findings.
- Answers will vary for student findings.

**On Level**

**Option 1**

**Materials:** paper, pencils, number cards 0–9

- Have students choose five number cards from the deck. They should write the digits on a separate sheet of paper and arrange the digits to form a number having up to three decimal places. Replace the cards and shuffle.
- Repeat the process to generate four or five numbers.
- Then have students compare their numbers and write them in order from least to greatest.

**Other Options**

- **Learning Station Card 6**
- **Get Connected**
  - Personal Tutor, Lesson Animations, eGames: Mount Frost

**English Language Learners**

This strategy helps English Learners use new vocabulary to order whole numbers and decimals.

Find **Core Vocabulary** and **Common Use Verbs** in the online EL strategies to help students grasp the math skills; use **Language Alerts** at point of use in the Teacher Edition.

- **Beginning**
  - **Word Meanings** Review language for talking about order.
    - Have students put themselves in order according to height or age.
    - Assign a whole number to each student and repeat the activity.
    - Repeat for decimals.
    - Review the vocabulary for order, least, and greatest.

- **Intermediate**
  - **Activate Prior Knowledge** Differentiate between whole numbers and decimals.
    - As you say numbers, have students use base-ten blocks to fill in the place value chart to represent the number.
    - Make sure to include some whole numbers as well as decimal numbers to the thousandths.
    - Periodically review vocabulary such as decimal, place value, tenths, tens, hundredths, and so on.

- **Advanced**
  - **Real-World Connections** Talk about stopwatch measurements.
    - If stopwatches are available, have students practice starting and stopping the watch. Can they make it stop on a whole number?
    - Have partners work together to time how long it takes to sharpen a pencil, walk to the classroom door and back, or write their names.
    - Have students record their times and practice saying each decimal number. For example, **It takes 19 and 34 hundredths seconds to sharpen a pencil.**

**Extend**

Have advanced students lead a discussion about what might happen if we only used whole numbers. How would this affect scientists’ work or the use of money, for example?
PART A  Order Whole Numbers and Decimals

Order Whole Numbers and Decimals

Objective
Order whole numbers and decimals.

Resources
Materials: grid paper
Manipulatives: spinner
Hands-On Activity Tools and Resources (p. 132)
Leveled Worksheets

INTRODUCE

Activity Choice 1: Hands-On
- Have students spin a spinner with digits 0–9 to form five-digit whole numbers. Ask two students to share their numbers with the class.
- Compare the numbers. Which number is greater? Answers will vary. How do you know? Sample answer: It is to the right of the other number on a number line.
- Ask two other students to share their numbers. Which number is less than the other? Answers will vary. How do you know? Sample answer: It is to the left of the other number on a number line.

Activity Choice 2: Active Math
- This activity can be completed as a whole class or in small groups of six students.
- Provide 5 students with a number card with a digit from 0 to 9. Provide one student with a card that shows a decimal point.
- Ask students to line up and create the greatest number possible. Ask students to rearrange themselves to make the smallest number possible.
- How can you change the value of the number by moving the decimal point? Moving the decimal point to the right increases the value of the number. Moving the decimal point to the left decreases the value of the number.

Extensions
- GLE 0506.2.1 Extend the understanding of place value through millions and millionths in various contexts and representations. Also addresses GLE 0506.1.7.

STADIUMS
The table shows the cost to build three National League Football stadiums. Order the costs of the stadiums from greatest to least.

<table>
<thead>
<tr>
<th>Stadium</th>
<th>Cost to Build (millions $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qwest Field</td>
<td>350.0</td>
</tr>
<tr>
<td>364.2</td>
<td></td>
</tr>
<tr>
<td>430.0</td>
<td></td>
</tr>
<tr>
<td>430.0</td>
<td></td>
</tr>
<tr>
<td>350.0</td>
<td></td>
</tr>
<tr>
<td>Seattle, WA</td>
<td>350.0</td>
</tr>
</tbody>
</table>

Another Way: Use a number line.

So, the costs, in millions of dollars, from greatest to least are 430.0, 364.2, and 350.0.

Building Math Vocabulary
Have students use their Math Journals to explain the meaning of the word decimal. Ask them to compare a decimal to a period (punctuation mark). Students may express that periods are used to separate one idea from another and into sentences. Decimals are used to separate whole numbers from parts of a whole. Periods are used with written words and decimals are used with numbers.
Order each set of numbers from least to greatest.  

1. weight in kilograms of a dog: 56.7, 64.3, 59.0, 64.5, 56.7, 59.0, 64.3, 64.5
2. rainfall in inches: 0.76, 0.09, 0.63, 0.24, 0.09, 0.24, 0.63, 0.76
3. height of flowers in inches: 8.9, 8.59, 8.705, 8.05, 8.05, 8.59, 8.705, 8.9
4. length of cells in millimeters: 0.000026, 0.0000033, 0.000006, 0.0000033, 0.000006, 0.000026
5. The length of insects in centimeters are: 1.35, 0.9, 1.48, and 1.8. Order the sizes of the insects from greatest to least. 1.8 cm, 1.48 cm, 1.35 cm, 0.9 cm
6. **TALK MATH** Discuss different steps that make ordering numbers easier.  

**Additional Answer**

Sample answer: lining up decimal points and annexing zeros makes comparing digits in the same place values easier.
Differentiate practice using these leveled assignments for the exercises in Practice and Problem Solving.

<table>
<thead>
<tr>
<th>Level</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL Approaching Level</td>
<td>7–12, 18–24 even, 25–37</td>
</tr>
<tr>
<td>OL On Level</td>
<td>7–17 odd, 18, 19–23 odd, 24–37</td>
</tr>
<tr>
<td>BL Beyond Level</td>
<td>7–17 odd, 18–37</td>
</tr>
</tbody>
</table>

HOT! Problems Have students discuss and complete the Higher Order Thinking problems. Encourage students to order the numbers from least to greatest and then solve the problems.

WRITE MATH Have students complete the Write Math Exercise in their Math Journals. You may choose to use this as an optional formative assessment.

Language Alert! Language for Ordering A review of some basic preposition words might be helpful when putting things in order. Using location on a number line as the context, model between, next to, before, after, and behind. Then have students find numbers using these location words.

Animated Graphic Novel Rewatch “Greenhouse Shopping Spree!”

Use the information to solve the problem.

17. The table shows the diameters of several types of viruses. Which virus has the greatest diameter? Which virus has the least diameter? Varicella Zoster; Ebolavirus

<table>
<thead>
<tr>
<th>Diameter of Common Viruses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Virus</td>
<td>m</td>
</tr>
<tr>
<td>Ebolavirus</td>
<td>0.00008</td>
</tr>
<tr>
<td>Influenza (Flu)</td>
<td>0.00009</td>
</tr>
<tr>
<td>Varicella Zoster (Chicken Pox)</td>
<td>0.00015</td>
</tr>
</tbody>
</table>

18. Order the prices of brands of seeds from least to greatest. EZ Garden seeds, $1.89; FasGro Seeds, $1.97; Garden Care, $2.19; Summer Green $2.88

WRITE MATH Have students explain how they determined the correct order of the prices.
19. The following measures are the long jump distances of the top six finishers in the 2008 Summer Olympics. Which distance was greater than 8.22 meters, but less than 8.29 meters? 8.24 m
8.07 m, 8.16 m, 8.24 m, 8.34 m, 8.19 m, 8.20 m

20. The table shows the heights of the tallest indoor waterfalls. Order the heights from greatest to least.

<table>
<thead>
<tr>
<th>Location</th>
<th>Height (meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotel Windsor, Michigan</td>
<td>18.3</td>
</tr>
<tr>
<td>International Center, Michigan</td>
<td>14.7</td>
</tr>
<tr>
<td>Mohegan Sun, Connecticut</td>
<td>26.1</td>
</tr>
<tr>
<td>Orchid Hotel, India</td>
<td>21.3</td>
</tr>
<tr>
<td>Trump Tower, New York</td>
<td>27.4</td>
</tr>
</tbody>
</table>

21. List the average baby body lengths from least to greatest. 15.2, 21.5, 27.9, 29.5

22. Write the names of the snakes in order from greatest to least average adult body length. Timber Rattlesnake, Western Cottonmouth, Copperhead, Queen Snake

23. The average length of an adult Eastern Coachwhip snake is 152.4 centimeters. Write a sentence comparing its length to the length of the other snakes listed in the table.

24. OPEN ENDED Write an ordered list of five numbers whose values are between 50.98 and 51.6. Tell whether your list is from least to greatest or greatest to least. Sample answer: 50.99, 51.05, 51.4, 51.5; least to greatest

25. WRITE MATH Write a real-world problem that can be solved by finding the least number from: 12.33, 12.2, 11.79, 11.9, and 12.05. See margin.

Additional Answer

25. Sample answer: The times for five runners are 12.33 seconds, 12.2 seconds, 11.79 seconds, 11.9 seconds, and 12.05 seconds. Find the time of the fastest runner; answer: 11.79 s.
26. Matt completed his first race in 15.163 seconds. The time of his second race was 15.24 seconds. Which of the following choices correctly shows the relationship between 15.163 and 15.24? A

A. 15.163 < 15.24  
B. 15.163 > 15.24  
C. 15.24 < 15.163  
D. 15.24 = 15.163

27. The table shows the seating capacity of the three largest stadiums in the world. Which is a true statement? F

<table>
<thead>
<tr>
<th>Stadium</th>
<th>Maximum Seating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maracanã Municipal (Brazil)</td>
<td>205,000</td>
</tr>
<tr>
<td>Rungrado (North Korea)</td>
<td>150,000</td>
</tr>
<tr>
<td>Strahov (Czech Republic)</td>
<td>240,000</td>
</tr>
</tbody>
</table>

F. The Maracanã Municipal is larger than the Rungrado.  
G. The Strahov is smaller than the Maracanã Municipal.  
H. The Maracanã Municipal is the largest stadium.  
I. The Strahov is the smallest stadium.

28. Replace each \(_25CEh\) with <, >, or = to make a true sentence. (Lesson 2D)

29. 2.79 \(_25CEh\) 2.37 >

30. 10.56 \(_25CEh\) 10.65 <

31. 7.3 \(_25CEh\) seven and three tenths

32. 0.81 \(_25CEh\) eighty-one hundredths

33. 2.99 \(_25CEh\) two and ninety-nine hundredths

34. 5.00046 \(_25CEh\) five and forty-six hundred thousandths

35. The table shows the seating capacity of the three largest stadiums in the world. Which is a true statement? F

<table>
<thead>
<tr>
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33. 2.99 \(_25CEh\) two and ninety-nine hundredths

34. 5.00046 \(_25CEh\) five and forty-six hundred thousandths

Multi-Part Lesson 3  Describe a real-world situation in which it would be important to compare decimals to the thousandths. Sample answer: Scientists often use very small numbers to measure and compare the size of different objects, including the measurements of parts on the space shuttle. Very precise measurements are helpful to scientists in preventing accidents and ensuring that the shuttle works properly.
Get Ready!
Players: 2 players

Get Set!
☆ Each player creates ten game sheets like the one shown at the right, one for each of ten rounds.
☆ Make a spinner as shown.

Go!
☆ One player spins the spinner.
☆ Each player writes the number in one of the blanks on his or her game sheet.
☆ The other player spins the spinner, and each player writes the number in a blank.
☆ Play continues until all blanks are filled.
☆ The person with the greater decimal scores 1 point. If players have the same decimal, each player scores 1 point.

Repeat for ten rounds.
The person with the greater number of points after ten rounds is the winner.

Differentiated Practice
Use these leveled suggestions to differentiate the game for all learners.

<table>
<thead>
<tr>
<th>Level</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>Students use game sheets with only a tenths place.</td>
</tr>
<tr>
<td>OL</td>
<td>Have students play the game with the rules as written.</td>
</tr>
</tbody>
</table>

Materials: spinner with digits 0 through 9, paper, pencils

Introduce the game on the student page to your students to play as a class, in small groups, or at a learning workstation to review concepts introduced in this chapter.

Instructions
- Students play in pairs. Each student creates ten game sheets and a spinner, as shown.
- Player 1 spins the spinner. Each player writes the number in one of the blanks on his or her game sheet.
- Player 2 spins the spinner and each player writes the number in one of the blanks on his or her game sheet.
- Play continues until all blanks are filled. The person with the greatest decimal scores 1 point.
- Play continues for ten rounds. The person with the most points at the end of ten rounds wins.

Extend the Game
- Have students make the game using two spinners and game sheets with a tens place, a ones place, a tenths place, and a hundredths place. Both players spin at the same time and use the numbers spun to fill in two of their blanks.
- For another game focusing on the same mathematical concept, see Game Time.
**Problem-Solving Strategy:** Work Backward

**Main Idea**
I will solve problems by using the work backward strategy.

**Resources**
- Leveled Worksheets
- Get ConnectED

---

**Objective**
Solve problems by using the work backward strategy.

**Resources**
- Leveled Worksheets
- Get ConnectED

---

**Activity Choice 1: Review**
- Write the following problem on the board:
  
  Lazaro made 5 dozen banana muffins for the bake sale. He wanted to package them into groups of four. How many packages of muffins did he make? 15

- What strategy would you use to solve the problem?
  
  Sample answer: draw a picture

- How many muffins did he bake? 60

- How many packages of 4 can he make? 15

**Activity Choice 2: RWPS Reader**
- Read Water Works as a class.

- Have students solve the problems using the four-step plan. Ask them to share which strategy they used.

- Ask students to work in pairs or independently to write their own problems. Have them trade problems with one another and solve.

---

**Problem-Solving Strategy: Work Backward**

**P.S.I. TEAM**

**VICTOR:** I spent $61 on some sandpaper for my model cars. I bought 2 packages of the smallest-grain sandpaper and spent the rest on the largest-grain sandpaper. How many packages of the largest-grain sandpaper did I buy?

**YOUR MISSION:** Find the number of packages of the largest-grain sandpaper.

**Understand**
You know that a total of $61 was spent. You know that 2 packages of the smallest-grain sandpaper were purchased. The rest was spent on the largest-grain sandpaper.

**Plan**
To solve this problem, you can work backward.

**Solve**
Order the sizes from least to greatest: 0.00103, 0.0036, 0.0115.

The smallest size is 0.00103, or ultra fine sandpaper. Victor spent $20 or $40 for ultra fine sandpaper. Subtract to find the remaining amount spent: $61 – $40 = $21.

The largest size is 0.0115, or fine sandpaper. Each package costs $7. Divide to find the number of packages bought: $21 ÷ $7 = 3.

So, Victor bought 3 packages of the largest-grain sandpaper.

**Check**

\[(2 \times $20) + (3 \times $7) = $61\]

**COMMON ERROR!**

Exercise 9 Students may confuse operations in a multi-step problem when they are working backward. For example, to begin this problem, students could solve this problem by adding the 7 rulers given out at the end of class to the 18 remaining rulers.
**EXTEND**

1. Sample answer: Since Victor knew the end result, he performed each operation in reverse order.

Refer to the problem on the previous page.

1. Explain how the work backward strategy helped Victor find how many packages of the largest grain of sandpaper he bought.

2. Suppose Victor bought 3 packages of very fine sandpaper at $10 each and some packages of fine sandpaper. If he spent $44, how many packages of fine sandpaper did he buy? 2 packages

3. Explain how you can check the solution to Exercise 2. Sample answer: Triple the price of very fine sandpaper and double the price of fine sandpaper; 

(3 × $10) + (2 × $7) = $44.

4. Explain when you would use the work backward strategy to solve a problem. Sample answer: when the end result is given and the exercise asks for the beginning value.

**PRACTICE**

Solve. Use the work backward strategy.

5. Luisa bought a roll of ribbon. She used 34 inches on each of two gifts. Then she used 13 inches on a scrapbook page. There are 39 inches left. How many inches did she start with? 120 in.

6. The table below shows the number of ounces of butter Marti used in different recipes. She has 6 ounces of butter left. How many ounces of butter did she have at the beginning? 24 oz

<table>
<thead>
<tr>
<th>Recipe</th>
<th>Butter (oz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pie</td>
<td>4</td>
</tr>
<tr>
<td>Cookie</td>
<td>8</td>
</tr>
<tr>
<td>Pasta</td>
<td>6</td>
</tr>
</tbody>
</table>

7. At the end of their 3-day vacation, the Palmers traveled a total of 530 miles. On the third day, they drove 75 miles. On the second day, they drove 320 miles. How many miles did they drive the first day? 135 mi

**Quick Check**

Are students continuing to struggle with choosing the best strategy?

During Small Group Instruction

If Yes → AL Daily Transparencies

If No → OL Skills Practice Worksheet

BL Enrich Worksheet

- Why do you subtract $40 from $61? You know $61 was spent in all and that $40 was spent on the smallest grain of sandpaper. The remaining amount will tell you how much of the total was spent on the largest grain.

**Check** Have students look back at the problem to make sure that the answer fits the facts given.

- How can you use a number sentence to check your answer? Sample answer: The number sentence 

(2 × $20) + (3 × $7) = $61 can be used to check the answer.

**Analyze the Strategy** Use the Extend Exercises to analyze and discuss the problem-solving strategy.

**Alternate Teaching Strategy**

If students have trouble choosing a strategy . . .

Then use one of these reteach options:

1. AL Reteach Worksheet

2. IWB Personal Tutor Have students use Personal Tutor to reteach the concept.

3. Use Posters Continue to encourage students to use the four-step plan. Have them make posters that illustrate the steps.

Understand

Plan

Solve

Check

**PRACTICE**

Using the Exercises

Exercises 5, 8, and 10 Encourage students to carefully review these multi-step problems for mixed operations.

Exercise 6 Students may choose to add the numbers in the table to the number used in the text of the exercise instead of working backward to find the solution.

**ASSESS**

Formative Assessment

Have students use the work backward strategy to solve. Tamika collects seashells. While on her spring vacation she lost 3 shells, but later that week, she found 15 new shells to add to her collection. She now has 28 shells. How many shells did she have before her spring vacation? 16 shells

Explain the order of the steps you took to find the solution.
Objective
Interpret information and data from geography to solve problems.

Activate Prior Knowledge
- The United States is on which continent? North America
- Which countries border the United States? Canada, Mexico

Use the Student Page
Ask students to read the information on the student page to answer these questions:
- Compare the decimals 16.995 and 9.162. Now look at the map on the student page. Does it make sense that Russia’s land area appears greater than the land area of the United States on the map? Sample answer: Yes, because Russia’s land area, 16.995 million square kilometers, is greater than the land area of the United States, 9.162 million square kilometers.
- Compare the land area of India to the land area of Argentina. Which is greater? The land area of India (2.973 million square kilometers) is greater than the land area of Argentina (2.736 million square kilometers).

Fun Facts
- The United States has the fourth largest land area in the world.
- The continental United States has four time zones: Eastern, Central, Mountain, and Pacific. Alaska and Hawaii each have their own time zone.
- The United States does not have an official language. Only 22 states have legislated English as the official language. Hawaii is officially bilingual, speaking Hawaiian and English.

Largest Countries in the World
- Russia 16.995
- China 9.326
- Brazil 8.457
- India 2.973
- Australia 7.617
- Argentina 2.736
- United States 9.162
- Canada 9.094
- Mexico 1.964

Did You Know?
About 0.2 of the area of the United States is water.

How big is the United States?
In total land area, the United States is about 9,162,000 square kilometers. This number can be written as a decimal, 9.162 million square kilometers. Like whole numbers, decimals can be used to compare the land area of the world’s largest countries. Compare the land area of Canada and the United States.

9.094 million < 9.162 million
Therefore, the land area of Canada is less than the land area of the United States.
Use the information on the previous page to solve each problem.

1. Write an inequality comparing the land area of Russia with the land area of Australia. Sample answer: 16.995 million > 7.617 million

2. Write an inequality comparing the land area of the United States with the land area of Australia. Sample answer: 9.162 million > 7.617 million

3. The land area of Canada is about 3 times as great as which country’s land area? Argentina and India

4. The land area of Brazil is about 8.457 million square kilometers, and the total area of Brazil is about 8.512 million square kilometers. Write an inequality comparing Brazil’s land area to its total area. Sample answer: 8.457 million < 8.512 million

5. Order the land area of Canada, China, and the United States from least to greatest. 9.094 million < 9.162 million < 9.326 million

Real-World Math

Assign the exercises on the student page. Encourage students to choose a problem-solving strategy before beginning each exercise.

Exercises 1–2, 4 Remind students to use the greater than (>) and less than (<) symbols to solve these exercises.

Exercise 3 Point out that multiple answers are required.

Exercise 5 Students must align the decimals and compare the numbers to complete this exercise.

WRITE MATH Have students write a real-world problem using the information found on the map on the student page.

Extend the Activity Have students list the countries on the map in order of size from greatest to least.
The BIG Idea

As a class, revisit this chapter’s Big Idea.

How can I use place value to read, write, compare, and order whole numbers and decimals?

Sample answer: To understand the value of a number, you must first understand place value. When writing and reading numbers it is important to understand that periods are separated by commas and that whole numbers are separated from parts of a whole by the decimal point. Aligning numbers based on their place value makes it much easier to compare whole numbers and decimals, because the value of a number depends on the placement of the digits.

Key Concepts with Foldables

Use these lesson suggestions to incorporate the Foldable during the chapter. Students can then use their Foldable to review for the test.

Lesson 2C Students use the right column of the Pocket Chart Foldable to write examples of decimals in standard form, expanded form, and short word form. Additional examples of student work and vocabulary definitions can be written on quarter sheets of paper or index cards and stored in the right side pocket.

Lessons 2D, 3A Students use the right column of the Pocket Chart Foldable to write examples of decimals. Students should include decimals to the tenths, hundredths, and thousandths. Additional examples of student work and vocabulary definitions can be written on quarter sheets of paper or index cards and stored in the right side pocket.

Key Vocabulary

Review chapter vocabulary using one of the following options.

- Visual Vocabulary Cards (9, 18, 20, and 46)
- eGlossary
- Vocabulary Test

Vocabulary Check

If students have difficulty answering the Exercises, remind them that they can use the Key Vocabulary terms listed on the student page. You may wish to also direct them to the lesson in which each term is taught.

Chapter Project

Map It! In pairs, small groups, or as a class have students discuss the results of their completed chapter project. Assess their work using the Project Rubric found in the Chapter Resource Masters.
### Multi-Part Lesson Review

#### Lesson 1: Whole Numbers

**Place Value Through Millions (Lesson 1A)**

Name the place value of the underlined digit. Then write the number it represents.

7. 195,489  
   place: ten thousands  
   value: 20,000

8. 6,720,341  
   place: millions  
   value: 6,000,000

Use place value to write each number in standard form.

9. 8,000,000 + 50,000 + 2,000 + 600 = 8,052,600

Write each number in expanded form. Then read and write in word form.

10. 4,302

11. 1,279,018

12. Measurement Montana has an area of 147,165 square miles. Write this number in word form.

**Compare and Order Whole Numbers (Lesson 1B)**

Replace each \( \_ \) with \(<\), \(>\), or \(=\) to make a true sentence.

13. 98 \(>\) 70

14. 234 \(<\) 1,510

15. 8,960 \(=\) 8,960

16. 814,789,002 \(>\) 814,789,020

17. Is the population of Jacksonville or San Francisco greater? Jacksonville

<table>
<thead>
<tr>
<th>City</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jacksonville, Florida</td>
<td>777,704</td>
</tr>
<tr>
<td>San Francisco, California</td>
<td>744,230</td>
</tr>
</tbody>
</table>

**Additional Answers**

11. 4,000 + 300 + 2 = four thousand, three hundred two

12. 1,000,000 + 200,000 + 70,000 + 9,000 + 10 + 8 = one million, two hundred seventy-nine thousand, eighteen

13. one hundred forty-seven thousand, one hundred sixty-five
Represent Decimals (Lesson 2B)

Use a model to write each fraction as a decimal.

21. $\frac{19}{100}$ 
22. $\frac{8}{10}$ 
23. $\frac{644}{1,000}$ 
24. $\frac{2}{100}$ 
25. four tenths 0.4 
26. thirteen thousandths 0.013 
27. Pedro made six tenths of the free throws he attempted this season. Write the fraction of free throws that he made as a decimal. 0.6
Compare Decimals (Lesson 2D)

Replace each \( \_25CEh \) with <, >, or \( = \) to make a true sentence.

35. 0.1 \( \_25CEh \) 0.11 <
36. 0.49 \( \_25CEh \) 0.71 <
37. 3.6 \( \_25CEh \) 3.16 >
38. 9.02 \( \_25CEh \) 9.020 =
39. 0.843 \( \_25CEh \) 0.846 >
40. 4.25 \( \_25CEh \) 4.025 >

Measurement

The table shows the speeds of two fish.

<table>
<thead>
<tr>
<th>Fish</th>
<th>Speed (mi per h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluefin tuna</td>
<td>43.4</td>
</tr>
<tr>
<td>Wahoo</td>
<td>48.5</td>
</tr>
</tbody>
</table>

Is the bluefin tuna or the wahoo faster? Tell why.

Additional Answers

30. 0.5 + 0.03; fifty-three hundredths; 53 hundredths
31. 0.06 + 0.008; sixty-eight thousandths; 68 thousandths
32. 1 + 0.2 + 0.02; one and twenty-two hundredths; 1 and 22 hundredths
33. 0.009 + 0.0007 + 0.00004 + 0.000005; nine thousand, seven hundred forty-five millionths
Lesson 3 Order Whole Numbers and Decimals

Order each set of numbers from least to greatest.

42. 13.84, 13.097, 13, 12.655, 13.6
   12.655, 13, 13.097, 13.6, 13.84

43. 0.63001, 0.00631, 0.06031
   0.00631, 0.06031, 0.63001

44. Refer to the table. List these countries from the greatest to least number of bikes per person.

<table>
<thead>
<tr>
<th>Country</th>
<th>Bikes per Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>0.37</td>
</tr>
<tr>
<td>Germany</td>
<td>0.88</td>
</tr>
<tr>
<td>Japan</td>
<td>0.63</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1.10</td>
</tr>
<tr>
<td>United States</td>
<td>0.49</td>
</tr>
</tbody>
</table>

45. Megan has 104 books on four bookshelves. On the first bookshelf, she has 21 books. On the second bookshelf, she has 39 books. She has the same number of books on the third and fourth bookshelves. How many books are on the third bookshelf? 22 books

46. After fundraising, a soccer team had a balance of $585. They spent $127 on posters for the fundraiser and $29 on an ad in the newspaper. If they made $563 during fundraising, how much money did they have before fundraising? $178

Chapter Study Guide and Review

Problem-Solving Strategy: Work Backward (Lesson 3B)

Order 60.11, 60, and 61.038 from least to greatest.

Step 1 60.11  Line up the decimal points.
        60
        61.038

Step 2 60.110  Annex zeros so all numbers have the same final place value.
            60.000
            61.038

Step 3 60.000  Compare and order using place value.
            60.110
            61.038

The numbers in order from least to greatest are 60, 60.11, and 61.038.
Data-Driven Decision Making

Based on the results of the Chapter Test, use the following to review concepts that continue to present students with problems.

<table>
<thead>
<tr>
<th>Exercises</th>
<th>Tennessee Standards</th>
<th>What's the Mathematics?</th>
<th>Error Analysis</th>
<th>Resources for Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–5, 7–10</td>
<td>GLE 0506.2.1</td>
<td>Use place value to write whole numbers and decimals.</td>
<td>Does not know vocabulary, or place value of decimals and whole numbers. Does not understand “standard form.”</td>
<td>Chapter Resource Masters</td>
</tr>
<tr>
<td>11–15</td>
<td>GLE 0506.2.1</td>
<td>Represent fractions that name tenths, hundredths, and thousandths as decimals</td>
<td>Does not know how to write a decimal for a fraction. Does not know decimal values.</td>
<td>Lesson Animations • Personal Tutor • Self-Check Quiz</td>
</tr>
<tr>
<td>16–25</td>
<td>GLE 0506.2.1</td>
<td>Use place value to read, write, compare, and order decimals and whole numbers.</td>
<td>Does not accurately identify value of numbers. Reverses “greater than” and “less than” signs. Reverses order of numbers.</td>
<td>Lesson Animations • Personal Tutor • Self-Check Quiz</td>
</tr>
<tr>
<td>6</td>
<td>GLE 0506.1.2</td>
<td>Use the four-step plan to solve a problem.</td>
<td>Does not use effective strategy to solve problem. Does not compute correctly.</td>
<td>Lesson Animations • Personal Tutor • Self-Check Quiz</td>
</tr>
</tbody>
</table>
Test Practice

1. **INTRODUCE**
   As a class, discuss the example on the page. The instructions in the example encourage students to use place value to compare numbers. Students should be careful to align the decimal point before comparing the numbers.

2. **TEACH**
   Before beginning the practice test, give students an opportunity to solve the Additional Example.

   **ADDITIONAL EXAMPLE**
   
   The average height for baby boys is 52.69598 centimeters at 0.5 months old and 59.60895 centimeters 2 months later. Which of the following numbers is NOT between 52.69598 and 59.60895?  
   A. 52.69595  
   B. 53.70895  
   C. 54.68724  
   D. 59.00000

3. **ASSESS**
   **Formative Assessment**
   - Use these pages as practice and cumulative review. The questions are written in the same style as those found on standardized tests.
   - You can use these pages to benchmark student progress, or as an alternate homework assignment.

   **TEST EXAMPLE**
   Normal body temperature for humans is between 97.8°F and 99.0°F. Which of the following numbers is NOT between 97.8 and 99.0?  
   A. 97.85  
   B. 97.91  
   C. 98.74  
   D. 99.01

   **Read the Test Item**
   Use place value to look for numbers that are between 97.8 and 99.0.

   **Solve the Test Item**
   Rename 97.8 as 97.80 and 99.0 as 99.00. Use place value to order the numbers.
   
   97.80  
   97.85  
   97.91  
   98.74  
   99.00  
   99.01

   So, 99.01 is NOT between 97.8 and 99.0. The answer is D.

   Read each question. Then fill in the correct answer on the answer sheet provided by your teacher or on a sheet of paper.

   1. At a school function, there are 12 parents for every 1 teacher. If there are 72 parents at the function, how many teachers are there?  
      A. 5  
      B. 6  
      C. 7  
      D. 8

   2. Start with 168,905.252. Increase the digit in the ten thousands place by 3, and decrease the thousandths digit by 2. What number results?  
      F. 148,905.234  
      G. 171,905.250  
      H. 198,905.232  
      I. 198,905.250

   **Test Practice exercises help students solidify their knowledge using exercises in a format similar to standardized tests.**
3. **SHORT RESPONSE** Write the number of students in the fifth grade in word form. *Two hundred thirty-seven*

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th Grade</td>
<td>237</td>
</tr>
<tr>
<td>6th Grade</td>
<td>215</td>
</tr>
</tbody>
</table>

4. What fraction is equivalent to the decimal 0.058? 
- A. \(\frac{58}{1000}\)
- B. \(\frac{58}{100}\)
- C. \(\frac{58}{1,000}\)
- D. \(\frac{58}{10,000}\)

5. The population of the city where Lydia lives is eight million, six hundred twenty thousand, four hundred one. Which is the standard form of this number? 
- F. 8,620,401
- G. 8,620,410
- H. 8,620,410
- I. 80,620,401

6. **GRIDDED RESPONSE** Eduardo wants to save $770 to buy a new refrigerator. He saves $110 per month. How many months will it take him to save enough money? 
- F. 0.00014
- G. 0.000014
- H. 14
- I. 14,000,000

7. What portion of the squares is shaded? Express your answer as a decimal and a fraction.
- A. 0.25, \(\frac{25}{100}\)
- B. 0.4, \(\frac{40}{100}\)
- C. 0.6, \(\frac{60}{100}\)
- D. 0.75, \(\frac{75}{100}\)

8. **SHORT RESPONSE** A machinist needs to cut a hole with a diameter of twenty-nine thousandths inch. By mistake, he cuts the hole 0.03 inch. Did he cut the hole too large or too small? Explain. Sample answer: He cut the hole too large. \(0.03 > 0.029\).

9. The distance across many human cells can be measured in millionths of a meter. The cell shown below is fourteen millionths meter across. Which of the following is fourteen millionths in standard form? 
- F. 0.00014
- H. 14
- G. 0.000014
- I. 14,000,000

**Need Extra Help?**
- If you missed question . . .
  - 2: 1-3B
  - 3: SPI 2.1, SPI 2.1
  - 4: SPI 2.1
  - 5: SPI 2.1
  - 6: SPI 2.1
  - 7: SPI 2.1
  - 8: SPI 2.1
  - 9: SPI 2.1

**Additional Practice**
- **Standardized Test Practice**
- **Get Connected**
  - Find additional test practice.
- **ExamView Assessment Suite**
  - Create practice worksheets or tests that align to your state’s standards.
PART A  PAGES 19–20

10. two million, six hundred seventeen thousand;
2,000,000 + 600,000 + 10,000 + 7,000

11. Sample answer: Write the number in a place-value chart to find that the digit 5 has a value of 50,000.

20. one million, four hundred twenty-nine thousand, two hundred five; 
1,000,000 + 400,000 + 20,000 + 9,000 + 200 + 5

21. seven million, eighty-two thousand, nine;
7,000,000 + 80,000 + 2,000 + 9

22. five million, nine hundred one thousand, four hundred fifty-two; 
5,000,000 + 900,000 + 1,000 + 400 + 50 + 2

23. eight million, two hundred thousand, thirteen; 
8,000,000 + 200,000 + 10 + 3

24. thirty million, eight hundred forty-two thousand, eighty-five; 
30,000,000 + 800,000 + 40,000 + 2,000 + 80 + 5

25. sixty-three million, nine hundred thirty thousand, fifty-three; 
60,000,000 + 3,000,000 + 900,000 + 30,000 + 50 + 3

26. three hundred nineteen million, nine hundred one thousand, nine hundred ninety; 
300,000,000 + 10,000,000 + 9,000,000 + 900,000 + 90,000 + 900 + 90

27. eight hundred million, four hundred ninety-three thousand, three hundred one; 
800,000,000 + 400,000 + 90,000 + 3,000 + 300 + 1

31. one hundred thirty-nine thousand, eight hundred fifty-two

32. ninety-two million, nine hundred fifty-five thousand, seven hundred ninety-three; 
90,000,000 + 2,000,000 + 900,000 + 50,000 + 5,000 + 700 + 90 + 3

33. Sample answer: no; This number is read as thirteen million, five hundred seven thousand, eight hundred four.

PART B  PAGE 30

31. 

33. Sample answer: If the short word form includes tenths, then write the number with 1 digit to the right of the decimal point. If the short word form includes hundredths, then write the number with 2 digits to the right of the decimal point. If the short word form includes thousandths, then write the number with 3 digits to the right of the decimal point.

Mid-Chapter Check

1. millions; 2,000,000

2. ten thousands; 50,000

3. hundredths; 0.05

4. thousandths; 0.002

5. four million, seven hundred thirty thousand

Practice Chapter Test

1. ten thousands; 30,000

2. hundred millions; 800,000,000

3. hundredths; 0.05

4. thousandths; 0.002

5. eighteen thousand, seven hundred nine

6. three million, five hundred twenty-four thousand, sixty-four

9. five and nine hundred twenty-one thousandths

10. fifteen hundred thousandths

PART C  PAGE 25

10. Sample answer: Mallory spent $45.78 on a pair of jeans. Kimberly spent $45.67 on her pair of jeans. Who spent a greater amount of money on jeans?; Mallory
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