1 Estimating 50 Thousand

Goal Use numbers you know to estimate 50 thousand objects.

1. Make a list of items in your home that you can count to 100.

   Suggested answer: cereal, coins, marbles, paper, candies, paper clips, etc. You must be able to count the items.

2. Choose one item from your list. Count 2 sets of 100 and put them in a pile. *Pile should contain 200 items.*

3. How many of those piles would make a quantity of 1000 items? Show your work.

   5 piles. 200 + 200 + 200 + 200 + 200 = 1000

4. How many piles of 1000 would make a quantity of 50 thousand items? Show your work.

   50 piles. Adding 1000 items 50 times gives 50 thousand.

At-Home Help

To estimate and represent 50 thousand, use familiar objects in smaller quantities.

For example: Use 100 pennies. Put them in rows in a shoe box. How many of these boxes will make 1 thousand pennies?

Answer is 10 times the boxes.

How can you use this answer to figure out the number of boxes needed for 10 thousand pennies?

Answer is 10 times previous answer.

How can you use this new answer to figure out the number of boxes needed for 50 thousand pennies?

Answer is 5 times previous answer.

5. Estimate what 50 thousand of those items would look like. How would you describe it to a friend?

   Suggested answers:

   50 thousand paper clips would fit into about 7 shoe boxes.

   50 thousand pennies would fit into about 5 shoe boxes.

6. Use another way to estimate 50 thousand of the same item. Describe your method in detail.

   Suggested answer: Count 500 items at a time and estimate how many piles of that amount would make 50 thousand items.

7. Choose another item from your list. Estimate what 50 thousand of these items would look like.

   See answer to Question 5.

CHAPTER 2

2

Reading and Writing Numbers

Goal   **Read, write, and model five-digit numbers.**

1. A file on your computer is 15 827 bytes long.

   a) Write this number in words.

   fifteen thousand eight hundred twenty-seven

   b) Write this number in expanded form.

   10 000 + 5000 + 800 + 20 + 7

   c) Draw a representation of 15 827 using base ten blocks.

Ten thousands	Thousands	Hundreds	Tens	Ones
			||	∴∴∙

2. Write each number in words and in expanded form.

   a) 35 247 ___*thirty-five thousand two hundred forty-seven*___

   30 000 + 5000 + 200 + 40 + 7

   b) 40 409 ___*forty thousand four hundred nine*___

   40 000 + 400 + 9

   c) 10 000 more than 50 030 ___*sixty thousand thirty*___

   60 000 + 30

   d) 1000 less than 70 007 ___*sixty-nine thousand seven*___

   60 000 + 9000 + 7

3. Write each number in standard form.

   a) fifty thousand eleven ___*50 011*___   **b)** 50 000 + 8000 + 60 + 3 ___*58 063*___

4. Your class collected 21 347 pennies for a penny drive. Write 21 347 in words and in expanded form.

   twenty-one thousand three hundred forty-seven   *20 000 + 1000 + 300 + 40 + 7*
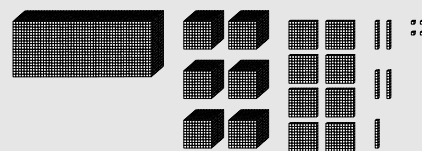
CHAPTER 2

3

Renaming Numbers

Goal   **Rename numbers with up to five digits.**

An ice cream company created the largest milkshake ever made. The company made a milkshake that would fill 24 382 one-litre containers.

1. Find five different combinations of full containers that would hold this milkshake. Show your work and record your answers in the table below.

V 10 000 L   **W** 1000 L   **X** 100 L   **Y** 10 L   **Z** 1 L
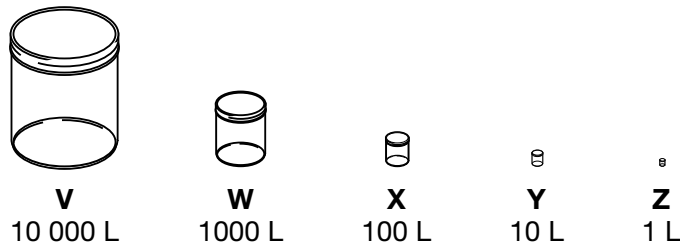
At–Home Help

Numbers can be named many different ways.

For example, 22 712 can be named
• 2 ten thousands 2 thousands 7 hundreds 1 ten 2 ones
• 22 thousands 7 hundreds 12 ones
• 227 hundreds 12 ones
• 2 ten thousands 27 hundreds 1 ten 2 ones
• 22 thousands 71 tens 2 ones

… and many more combinations of thousands, hundreds, tens, and ones.

Suggested answer:

Container V 10 000 L	Container W 1000 L	Container X 100 L	Container Y 10 L	Container Z 1 L
2	4	3	8	2
0	24	0	38	2
2	0	43	7	12
2	3	13	5	32
1	14	3	0	82
2	4	2	18	2

2. Draw 2 representations of 24 382 using base ten blocks.

Ten thousands	Thousands	Hundreds	Tens	Ones

CHAPTER 2

4

Comparing and Ordering Numbers

Goal   **Compare and order numbers with up to five digits.**

1.

Blue Jays' opponents	Average attendance in Toronto	Average attendance at opponent's stadium
Orioles	20 572	27 955
Devil Rays	20 459	9048
Expos	31 571	12 782
Yankees	27 205	33 916
Angels	20 106	41 088

a) Which teams had a greater attendance when in their home stadium?

Orioles, Yankees, and Angels

b) Show the attendance of three games on the number line.

20 106   20 459   20 572

20 100   20 200   20 300   20 400   20 500   20 600

At–Home Help

When comparing and ordering numbers up to five digits, compare the digits in this order:
- ten thousand
- thousand
- hundred
- ten
- one

You can also compare and order numbers by their positions on a number line.

Inequality signs $<$ and $>$ show that one number is greater than another.

For example, $8 > 5$ is read "eight is greater than five."

$5 < 8$ is read "five is less than eight."

2. Complete each number sentence using $<$ or $>$.

a) 20 899 __$>$__ 20 100

c) 45 072 __$<$__ 47 072

e) 90 000 __$>$__ 89 999

b) 3687 __$>$__ 3675

d) 24 531 __$>$__ 23 154

f) 19 560 __$<$__ 20 650

3. Order each group of numbers from greatest to least using inequality signs.

a) 14 532   8927   41 536   50 001

_50 001 > 41 536 > 14 532 > 8927_

b) 67 013   6713   67 130   67 103

_67 130 > 67 103 > 67 013 > 6713_

4. Adrian collected pennies for a penny drive. He wrote the total number of pennies on separate cards. Each card had a 1, 8, 3, 5, or 4. The cards got all mixed up. He knew that the number of pennies was between 20 000 and 45 000. List three possibilities for the number of pennies.

Suggested answers: 43 851, 43 581, 41 853, 41 835, 38 514, 38 451, 35 841, 35 481, 34 851, 34 581, 31 845, and 31 854. Arrangements of digits must begin with 43, 41, 38, 35, 34, or 31 thousand.

5 Rounding Numbers

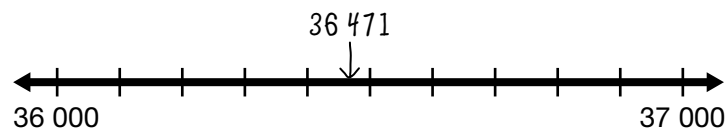**Goal** **Round numbers to the nearest ten thousand, thousand, and hundred.**

A doughnut machine has a counter to record the number of doughnuts made in a day. Yesterday the count was 36 471.

At-Home Help

Numbers can be **rounded** to the nearest hundred, thousand, and ten thousand.

For example, 85 354 rounded
- to the nearest hundred is 85 400
- to the nearest thousand is 85 000
- to the nearest ten thousand is 90 000

A number line helps with rounding.

1. Round the number of doughnuts to the nearest hundred. Explain your answer.
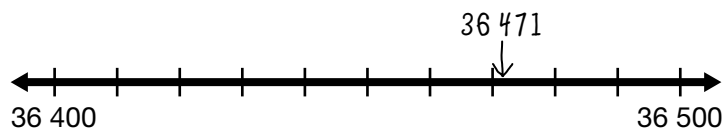
36 471

36 400   36 500

36 500. 36 471 is closer to 36 500 than 36 400.

2. Round the number of doughnuts to the nearest thousand. Explain your answer.

36 471

36 000   37 000

36 000. 36 471 is closer to 36 000 than 37 000.

3. Use the number line to round the number of doughnuts to the nearest ten thousand. Explain your answer.
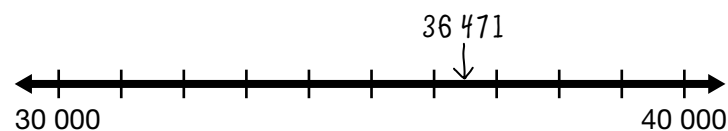
36 471

30 000   40 000

40 000. 36 471 is closer to 40 000 than 30 000.

4. Round each number to the nearest hundred, thousand, and ten thousand.

a) 45 632

45 600

46 000

50 000

b) 60 119

60 100

60 000

60 000

c) 75 456

75 500

75 000

80 000

6 Communicate About Numbers in the Media

Goal **Evaluate the use of numbers in the media.**

Gen is doing a science project on Canada geese. She found this information on a Web page.

The Canada goose is well known for its V-shaped migratory flight pattern and characteristic honk.

There are 11 geographical species, some with populations well over a million, and some with barely over one thousand.

In 1991 there were 63 581 Canada geese in the United Kingdom.

The largest goose is the giant, with a wingspan of more than 2 m and a mass under 10 kg. The smallest is the so-called "cackling" goose, which has a mass of only 1–2 kg.

Between 1983 and 2000, the size of the urban wintering flock in Wichita grew from 1623 birds to over 15 000!

At-Home Help

Numbers are reported in the media to give information. This information is not always correct.
- When reporting a large number, use a rounded number instead of an exact number.
- When rounding, round to the most appropriate place value.
- Use ranges so that a reader can tell the difference between least and greatest values.

Communication Checklist
☑ Did you explain your thinking?
☑ Did you use math language?
☑ Did you include the right amount of detail?

1. What numbers on the Web page do you find confusing?

   A range of numbers for populations is more useful than saying over a million, or barely over one thousand. Population in the United Kingdom should have been rounded to the nearest hundred. Size of wingspan and mass of the giant are not clear; over 2 m could be any number greater than 2, just as under 10 kg could be any number less than 10.

2. Are all the numbers described in the same way?

   No, some numbers are exact and some are rounded. Other numbers are estimates.

3. Do you agree with how the numbers 1623 and 15 000 are represented?

   Populations in Wichita should have been rounded to the nearest hundred. 1623 should have been reported as 1600, and 15 000 should have been rounded to the nearest hundred as well.

4. Where would you like to see a range given?

   Ranges would be useful for the populations of the 11 geographical species, and for the wingspan and mass of the giant.

CHAPTER 2

7 Decimal Hundredths
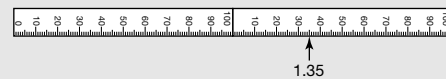
Goal **Read, write, and represent decimal hundredths.**

1. In gym class, students practised long jump in the sandpit. Paige recorded her friends' jumps in a chart.

Long jump distances	
Sean	1.27 m
Dan	0.96 m
Lisa	1.36 m

At–Home Help

The number 1.35 is read "one and thirty-five hundredths."

This number can be represented on a metre stick number line.
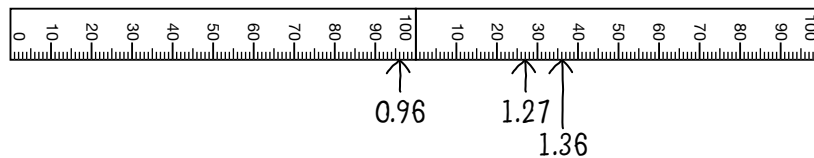

1.35

a) Use words to represent each distance.

1.27: one and twenty-seven hundredths of a metre,

or one metre and twenty-seven centimetres

0.96: ninety-six hundredths of a metre, or ninety-six centimetres

1.36: one and thirty-six hundredths of a metre, or one metre and thirty-six centimetres

b) Mark each distance on the metre stick number line.

0.96   1.27

1.36

2. Write each decimal number in standard form.

a) six and seven hundredths ——————— 6.07

b) five and ten hundredths ——————— 5.10

c) fourteen and fifteen hundredths ——————— 14.15

d) twenty-six hundredths ——————— 0.26

3. Write a decimal number in standard form to fit each description.

a) 1 tenth greater than 4.16 ——————— 4.26

b) 1 greater than 4.16 ——————— 5.16

c) 1 hundredth greater than 4.16 ——————— 4.17

4. Sally's best long jump distance is 1.63 m. Write in words how you would read her distance.

one and sixty-three hundredths of a metre, or one metre and sixty-three centimetres

CHAPTER 2

8

Exploring Equivalent Decimals

Goal   **Rename a decimal tenth as a decimal hundredth.**

1. Write a decimal tenth to describe the part of the grid that is shaded.

0.6

2. Write a decimal hundredth to describe the same part.

0.60
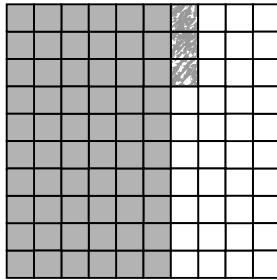
3. Shade in three more squares on the grid.

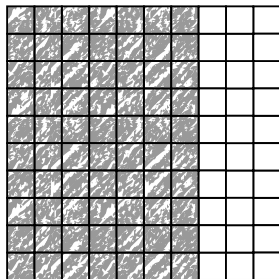**4.** Write a decimal number for the total shaded part.

0.63

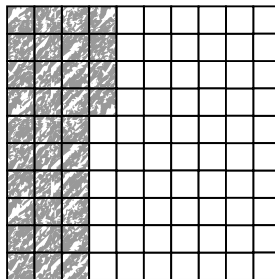**5.** Write two ways to read this decimal number.

sixty-three hundredths

or six tenths three hundredths

6. Show each decimal number on a grid by shading the appropriate squares.

a) 0.70

b) 0.34

c) 0.07
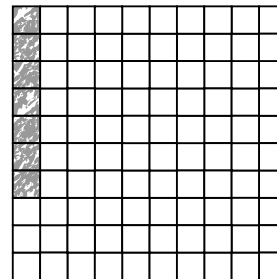
7. Which of these decimal hundredths can be expressed as decimal tenths? Give reasons for your choice.

0.70   0.07   0.77   0.17

0.70. It is the only number that has a 0 in the hundredths place value.

All the other numbers have a 7 in the hundredths place value.
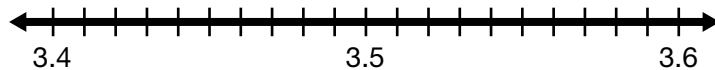
CHAPTER 2

9
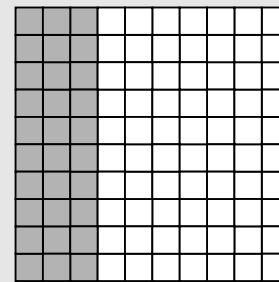
Rounding Decimals

Goal

Interpret rounded decimals, and round decimals to the nearest whole and to the nearest tenth.

1. Sarah rounded the length of her room to the nearest tenth of a metre. The length is 3.5 m.

3.4 3.5 3.6

a) Write the numbers that round up from 3.4 to 3.5.

If the number has a hundredth decimal place,

it can be: 3.45, 3.46, 3.47, 3.48, and 3.49.

b) Write the numbers that round down to 3.5.

If the number has a hundredth decimal place,

it can be: 3.50, 3.51, 3.52, 3.53, and 3.54.

At–Home Help

Decimal numbers can be rounded to the nearest whole number and the nearest tenth.

For example,
- 2.76 rounds up to 2.8
- 2.83 rounds down to 2.8

A number line helps with rounding.

2.76 2.83

2.7 2.8 2.9

Both 2.76 and 2.83 round up to 3.

2. Lori needs 4.47 m of ribbon for a school play.

a) How much ribbon should she buy if ribbon is sold in lengths of whole metres?

5 m

b) How much ribbon should she buy if ribbon is sold in lengths of tenths of a metre?

4.5 m

3. Round each number to the nearest whole number and the nearest tenth.

a) 3.65	**b)** 7.03	**c)** 0.79	**d)** 7.93
4	7	1	8
3.7	7.0	0.8	7.9

4. A gardener needs 8.74 m of hose to water a lawn.

a) Round that length to the nearest tenth of a metre. _____ 8.7 m _____

b) Should he buy a hose of that length or a different length? Explain.

He should buy a hose that is longer than 8.7 m, otherwise the hose will be too short.

5. A number rounded to the nearest tenth is 7.9. What might the number be? List three possibilities.

If the number has a hundredth decimal place, it can be:

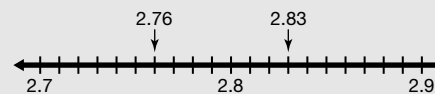7.85, 7.86, 7.87, 7.88, 7.89, 7.90, 7.91, 7.92, 7.93, or 7.94.

CHAPTER 2

10 Comparing and Ordering Decimals

Goal   **Compare and order numbers to decimal hundredths.**

1. Four members of the Sea Lions team competed in a relay race at a recent swim meet.

Swimmer	Stroke	Time
Zoe	Butterfly	2.54 s
Karilyn	Back	2.36 s
Andrea	Breast	2.75 s
Tanya	Freestyle	2.17 s

a) Who took the longest to swim her part of the race? What was her time?

Andrea, 2.75 s

b) Who swam the fastest? What was her time?

Tanya, 2.17 s

c) Order the times from shortest to longest.

2.17 s, 2.36 s, 2.54 s, 2.75 s

2. Draw a representation of Zoe's time using base ten blocks. Draw a hundreds block to represent 1.

Ones	Tenths	Hundredths
□ □	|||||	∶ ∶

At-Home Help

When comparing and ordering decimal numbers to hundredths, represent the numbers using base ten blocks. Then compare the numbers.

For example:
6.84 can be represented as

Ones	Tenths	Hundredths

6.99 can be represented as

Ones	Tenths	Hundredths

Compare these two representations to pick the greater number.

3. Complete each number sentence using < or >.

a) 3.94 __<__ 3.99   **b)** 46.03 __<__ 47.06   **c)** 20.80 __>__ 20.08

4. Order each group of numbers from least to greatest using inequality signs.

a) 0.23, 4.75, 6.35, 0.79, 4.57   *0.23 < 0.79 < 4.57 < 4.75 < 6.35*

b) 5.15, 1.55, 0.51, 15.01   *0.51 < 1.55 < 5.15 < 15.01*
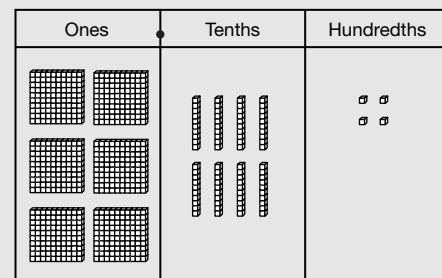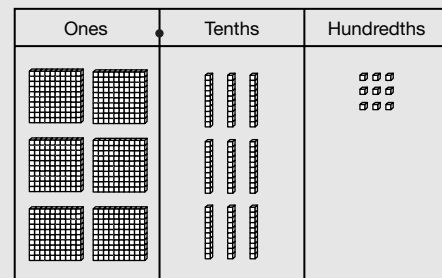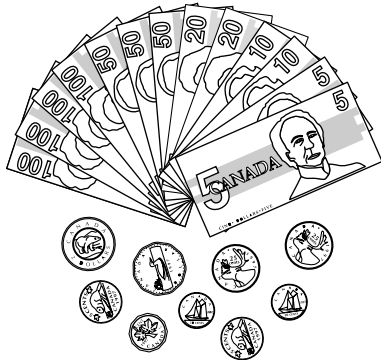
c) 0.31, 0.13, 0.03, 0.01   *0.01 < 0.03 < 0.13 < 0.31*

d) 6.1, 6.5, 6.06, 6.75, 6   *6 < 6.06 < 6.1 < 6.5 < 6.75*

11 Counting Money

Goal **Estimate, count, read, and write money amounts to $1000.**

1.

At-Home Help

When counting money, first count the bills. Then count the coins.

For example:
The amount shown is $420.80.

Different combinations of bills and coins can make the same amount.

a) Estimate the total. Explain your estimate.

Suggested answer: $620.

I counted the bills and guessed the amount in coins.

b) Count the amount. Record it.

$623.81

2. Describe or draw another set of coins and bills that make the same amount as in Question 1.

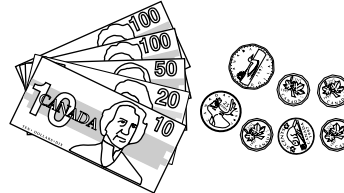Suggested answer: six $100 bills, one $20 bill, three $1 coins, three quarters, one nickel, and one penny
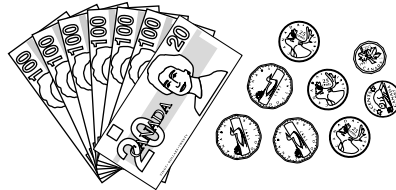
3. Describe or draw each amount using the fewest bills and coins possible.

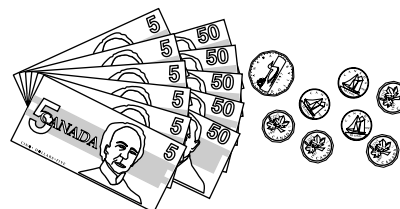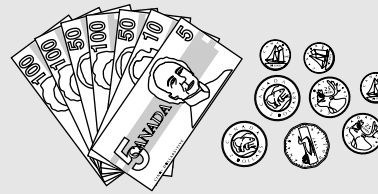**a)** $16.54 one $10 bill, one $5 bill, one $1 coin, two quarters, and four pennies

b) $281.34 two $100 bills, one $50 bill, one $20 bill, one $10 bill, one $1 coin, one quarter, one nickel, and four pennies

4. Describe or draw $281.34 using more bills and coins.

Suggested answer: five $50 bills, six $5 bills, one $1 coin, three dimes, and four pennies

CHAPTER 2

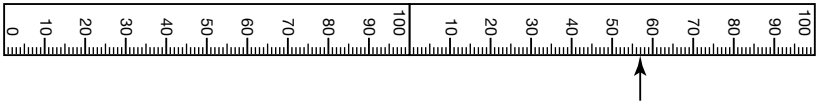# Test Yourself

Circle the correct answer.

1. Which container would you choose to put 50 thousand pennies?

   A. 5 shoe boxes   **B.** 5 lunchboxes   **C.** 5 bathtubs   **D.** 5 recycling boxes

2. Which representation is *not* the number 23 709?

   A. 20 000 + 3000 + 700 + 9

   B. 10 000 + 13 000 + 500 + 209

   C. 1 ten thousand + 13 thousand + 5 hundred + 20 tens + 9

   D. 10 000 less than 25 709

3. Which number sentence is incorrect?

   A. 20 899 < 28 100   **B.** 5697 > 5675

   C. 54 072 > 45 072   **D.** 34 521 < 34 125

4. Which number is rounded to the nearest hundred?

   A. 45 630   **B.** 75 000   **C.** 61 300   **D.** 10 001

5. What would 89 605 rounded to the nearest thousand be?

   A. 89 000   **B.** 89 600   **C.** 90 000   **D.** 90 600

6. Which number on the metre stick number line does the arrow point to?

   A. 1.60   **B.** 1.50   **C.** 1.57   **D.** 1.55

7. Which description fits for the number 2.67?

   A. two and six tenths   **B.** twenty-six and seven hundredths

   C. two hundred sixty-seven   **D.** two and sixty-seven hundredths

8. Which number is 1 tenth greater than 2.67?

   A. 3.78   **B.** 2.78   **C.** 3.67   **D.** 2.77

9. What would 7.86 rounded to the nearest tenth be?

   A. 8.0   **B.** 7.8   **C.** 8.6   **D.** 7.9