

3.6 Estimating Differences

Student Book page 83

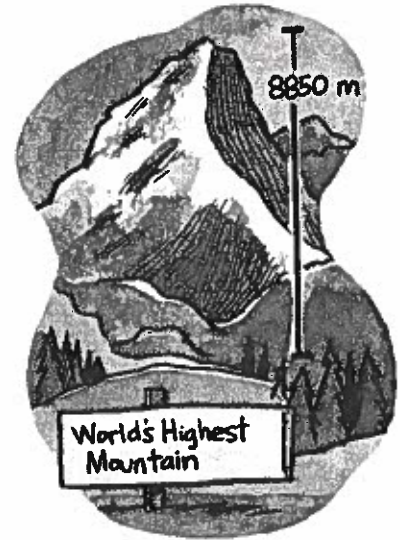
GOAL

Use your own strategies to estimate differences.

Mount Everest is the world's highest mountain.

It is 8850 m tall.

Tien made a chart to show the highest mountains in Western and Northern Canada.

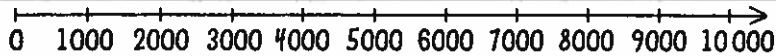


Province/Territory	Name	Height (m)
Yukon	Mount Logan	5959
British Columbia	Fairweather Mountain	4663
Alberta	Mount Columbia	3747

? About how much taller is Mount Everest than each mountain on Tien's chart?

Step 1: Use a number line to estimate for Mount Logan.

Show your work.



About how much higher is Mount Everest than Mount Logan? _____

Step 2: Choose your own strategies to estimate for Fairweather Mountain and Mount Columbia.

Mount Everest is about _____ m higher than Fairweather Mountain.

Mount Everest is about _____ m higher than Mount Columbia.

3.6 Estimating Differences

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GOAL

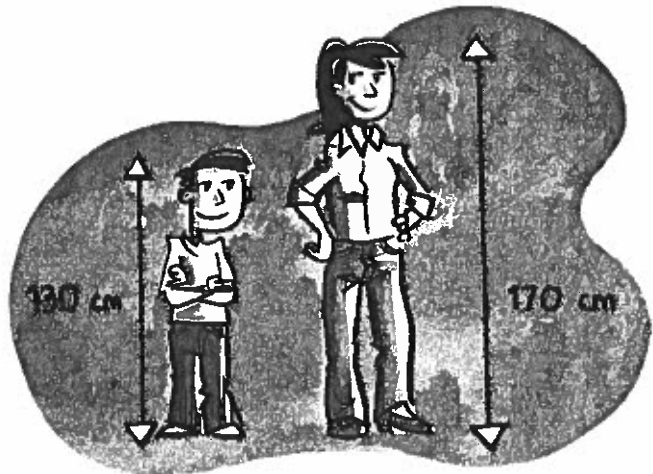
Estimate differences using a number line.

Problem

Jack is 130 cm tall.

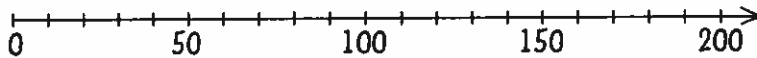
His mother is 170 cm tall.

 How can you estimate the difference between Jack's height and his mother's height?



Use a number line.

Show all your steps.



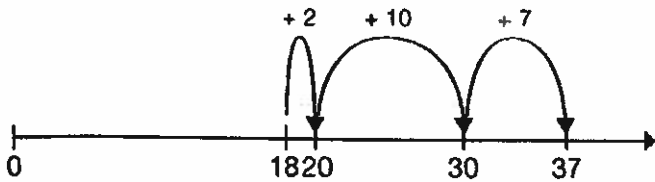
Jack's mother is _____ cm taller than Jack.

What other strategies could you have used to solve the problem?

Name: _____

Date: _____

- You can subtract by adding on.
To calculate $37 - 18$, think of $18 + \square = 37$.



Stop at friendly numbers along the way.

$$18 + (2 + 10 + 7) = 37$$

$$18 + 19 = 37$$

$$\text{So, } 37 - 18 = 19$$

Remember

- Sometimes it is easier to subtract different parts of a number one at a time.

Try These

1. Circle the best estimate. Explain how you estimated.

possible estimates

a) $88 - 39$ 30 40 50

b) $48 - 20$ 20 30 40

c) $91 - 38$ 50 60 70

2. Estimate each difference. Explain your thinking.

a) $58 - 17$ is about _____.

b) $37 - 25$ is about _____.

c) $36 - 29$ is about _____.

Name: _____

Date: _____

3. You can calculate $64 - 49$ using a 100 chart.
Subtract in parts starting at 64.
To subtract 40, go up 4 rows.

To subtract 9, go up 1 row and right 1
to subtract 10 and then add back 1.

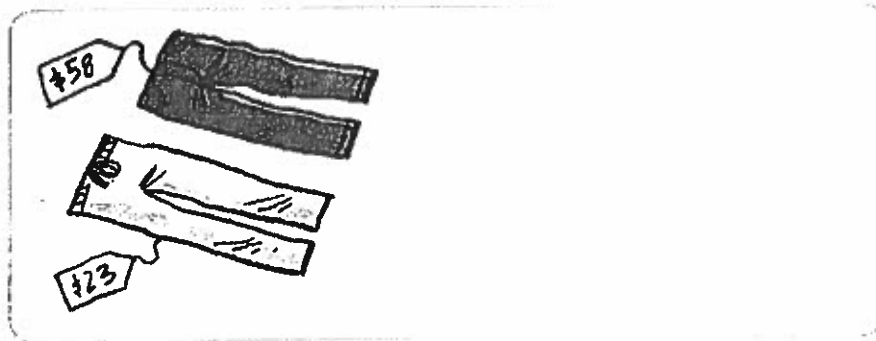
$$64 - 49 = 15$$

Use the 100 chart to subtract.
Use a different colour for each subtraction.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

- a) $22 - 11 =$ _____ c) $65 - 26 =$ _____
b) $65 - 24 =$ _____ d) $72 - 17 =$ _____

4. What is the difference in price?
Solve the problem. Show your work.



5. Show 2 ways to complete each subtraction.

a) $48 - 7$

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b) $75 - 37$

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Chapter 3
Lesson 6

Estimating Differences

GOAL

Use your own strategies to estimate differences.

1. Joshua and his friends are raising money for a school trip. Each class needs \$3000. The chart shows how much each class has raised.

Class	Money raised	Money still needed
Joshua's class	\$1047	
Chu Lee's class	\$2516	
Nicola's class	\$517	
Desmond's class	\$1998	
Heiko's class	\$2905	
Sandra's class	\$989	

At-Home Help

Here are some ways to estimate differences.

- Use base ten blocks or counters to model the problem.
- Use a number line to model the problem.
- Estimate by subtracting the closer hundreds or thousands (e.g., 1130 is closer to 1000 than 2000).

- a) Estimate the amount of money each class still needs.
 Record your answers in the chart.

- b) How did you estimate the differences? _____

2. 290 cm is cut from a 510 cm ribbon.
 About how many centimetres long is the ribbon now?

3. There are 7100 people in Petrock Town. 3900 are adults.
 About how many are children?

Estimating Differences

Goal Estimate differences by rounding.

1. Estimate. Show your rounded numbers.

a) $2867 - 913$ is about equal to

b) $4511 - 1489$ is about equal to

c) $6156 - 722$ is about equal to

d) $4999 - 1099$ is about equal to _____

e) $8504 - 2571$ is about equal to _____

2. Estimate the answers to these problems.

Show your rounded numbers.

a) A library has 6756 books. 2567 are on loan.
About how many books are left in the library?

b) A plane flying at a height of 7458 m drops down 3288 m.
At about what height is it flying now?

c) Mount Logan, the highest point in Canada, is 5959 m tall.
Mount Everest, the highest point in the world, is 8850 m tall.
About how much taller is Mount Everest than Mount Logan?

3. Estimate to show if the answer is reasonable.

$7653 - 2987 = 2666$ _____

At-Home Help

You can use rounded numbers to **estimate a difference** (the answer when you subtract).

$$\begin{array}{ccc} & 4859 & - 2598 \\ & \swarrow & \searrow \\ \text{close to } 5000 & & \text{close to } 2500 \end{array}$$

The difference is about
 $5000 - 2500 = 2500$.

3.7 Subtracting Numbers Close to Tens or Hundreds Page 1

Student Book pages 84–86

GOAL

Use mental math to subtract.

Problem

Kate and Max are reading books.

Kate has read 210 pages of her book.

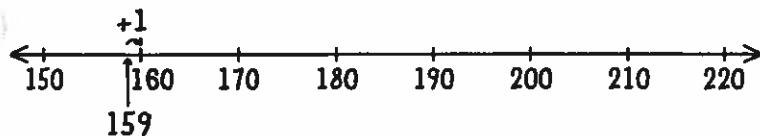
Max has read 159 pages of his book.



 How many more pages has Kate read than Max?

Use a number line.

Step 1: Mark 159 and 210 on the number line.



Step 2: Jump from 159 to the closest ten.

This step has been done for you.

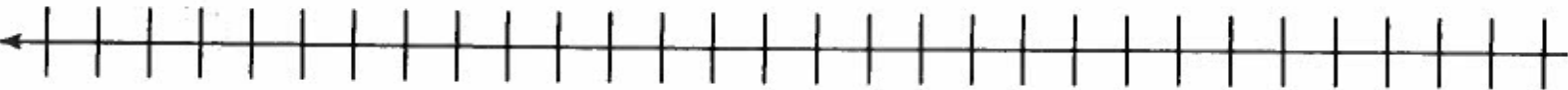
Step 3: Jump by tens from 160 to 210.

Show your jumps on the number line.

3.7 Subtracting Numbers Close to Tens or Hundreds Page 2

Reflecting

Why did it help to jump from 159 to the closest 10?



Chapter 3
Lesson 7

Subtracting Numbers Close to Hundreds or Thousands

GOAL

Use mental math to subtract.

1. Use mental math to calculate. Show your work.
The first one is done for you.

a) $1000 - 197 = \underline{803}$

$197 + 3 + 800 = 1000$, so $3 + 800 = 803$

b) $2000 - 498 = \underline{\hspace{2cm}}$

c) $1000 - 299 = \underline{\hspace{2cm}}$

d) $5000 - 3996 = \underline{\hspace{2cm}}$

e) $602 - 499 = \underline{\hspace{2cm}}$

f) $4006 - 2999 = \underline{\hspace{2cm}}$

At-Home Help

To subtract, add to the smaller number until you reach the greater number. For example:
 $1904 - 897 = \square$

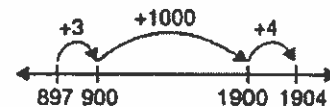
This is the same as
 $897 + \square = 1904$

To reach 1904, add numbers to 897:

$$897 + 3 = 900$$

$$900 + 1000 = 1900$$

$$1900 + 4 = 1904$$



The difference is

$$3 + 1000 + 4 = 1007.$$

2. A library has 5000 books. 1997 are on loan.
How many books are left in the library?

Subtracting Mentally

Goal

Develop mental math strategies for subtracting 2-digit numbers.

1. Add the same number to each number to make subtracting easier. Record only the answer.

a) $56 - 18 =$ _____

b) $61 - 19 =$ _____

c) $45 - 28 =$ _____

d) $51 - 39 =$ _____

e) $32 - 9 =$ _____

f) $75 - 49 =$ _____

g) $83 - 28 =$ _____

h) $65 - 48 =$ _____

2. Use mental math to solve each problem.

- a) It is 33°C in one town and 9°C in another town.

What is the difference in temperature between the towns?

- b) Licorice costs 62 cents. Gumballs cost 39 cents.

How much more does the licorice cost than the gumballs?

- c) 19 cm is cut from a 51 cm ribbon.

How many centimetres long is the ribbon now?

- d) There are 71 students in grade 4.

39 are girls. How many students are boys?

At-Home Help

Adding the same number to each number in a subtraction question does not change the answer.

$$\begin{array}{r} 6 + 2 \longrightarrow 8 \\ -1 + 2 \longrightarrow -3 \\ \hline 5 \qquad \qquad \qquad 5 \end{array}$$

Adding the same number can sometimes make it easier to subtract.

$$\begin{array}{r} 37 + 2 \longrightarrow 39 \\ -18 + 2 \longrightarrow -20 \\ \hline 19 \end{array}$$

$$37 - 18 = 39 - 20 \\ = 19$$

3.8 Regrouping before Subtracting Page 1

Student Book pages 88–90

GOAL

Solve subtraction problems by regrouping first.

You will need

- base ten blocks



- a place value chart

Thousands	Hundreds	Tens	Ones

Problem

A video store has 457 DVDs.
148 DVDs have been rented.

How many DVDs are left at the video store?

Make a model to solve the problem.

Step 1: Model 457 with base ten blocks.

This step has been done for you.

Hundreds	Tens	Ones

	4	5	7
-	1	4	8

Step 2: Compare the numbers column by column.

Do you need to regroup to subtract 1 hundred from 4 hundreds? _____

Do you need to regroup to subtract 4 tens from 5 tens? _____

Do you need to regroup to subtract 8 ones from 7 ones? _____

Trade 1 of the tens for 10 ones.

Hundreds	Tens	Ones

	4	17	
-	1	4	8
		9	

L Name: _____ Date: _____

3.8 Regrouping before Subtracting Page 2

Step 3: Subtract the hundreds, tens, and ones.

Count the blocks that are left.

There are _____ DVDs left at the video store.

Reflecting

How could you have estimated the number of DVDs that are left at the video store?

1. A video store has 1257 DVDs.

Model 1257 using base ten blocks.

Draw your model in the place value chart.

Thousands	Hundreds	Tens	Ones

Step 2: Draw your model after regrouping.

Thousands	Hundreds	Tens	Ones

Step 3: Subtract 780. Draw your model after subtracting.

Thousands	Hundreds	Tens	Ones

How many DVDs are left at the video store?

Chapter 3
Lesson 8

Regrouping before Subtracting

GOAL

Solve subtraction problems by regrouping first.

1. Calculate by regrouping.

a)

	1	9	7	3
-		5	2	7

d)

	3	2	3	8
-		1	9	4

b)

	2	5	2	8
-		1	4	6

e)

	6	8	8	5
-		7	3	6

c)

	5	1	3	6
-		4	1	0

f)

	3	1	6	7
-		2	4	8

At-Home Help

To help you subtract, you can regroup. For example:

$$\begin{array}{r} 1\ 14\ 8\ 12 \\ \cancel{2}\ \cancel{4}\ \cancel{9}\ \cancel{2} \\ -\ 6\ 8\ 3 \\ \hline 1\ 8\ 0\ 9 \end{array}$$

- You need more than 4 hundreds to take away 6 hundreds. You can regroup 2 thousands 4 hundreds as 1 thousand 14 hundreds.
- You need more than 2 ones to take away 3 ones. You can regroup 9 tens 2 ones as 8 tens 12 ones.

2. Calculate using regrouping or mental math.

a) $3001 - 1999 = \underline{\hspace{2cm}}$

c) $5008 - 2997 = \underline{\hspace{2cm}}$

b) $1875 - 1364 = \underline{\hspace{2cm}}$

d) $2738 - 342 = \underline{\hspace{2cm}}$

Subtracting from 4-Digit Numbers

Goal Use a paper and pencil method to subtract from a 4-digit number.

1. Estimate the difference. Then subtract.
Show your work.

a)
$$\begin{array}{r} 3234 \\ - 533 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 8129 \\ - 411 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 2045 \\ - 1236 \\ \hline \end{array}$$

e)
$$\begin{array}{r} 1566 \\ - 807 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 2000 \\ - 621 \\ \hline \end{array}$$

f)
$$\begin{array}{r} 5003 \\ - 347 \\ \hline \end{array}$$

2. Estimate and solve.

- a) The average yearly precipitation (rain and snow) in Toronto is 819 mm. The greatest average yearly precipitation in Canada is 6655 mm in Henderson Lake, B.C. What is the difference in precipitation between Henderson Lake and Toronto?
- b) A town has 1100 adults. 589 are women. How many men are there?
- c) A school is trying to raise \$1000 for a charity. \$795 has already been raised. How much more money must the school raise?

At-Home Help

You can subtract larger numbers by regrouping the top number in several steps.

$$\begin{array}{r} 013516 \\ 1366 \\ - 448 \\ \hline 918 \end{array}$$

The answer seems reasonable because $1400 - 400 = 1000$ and 918 is close to 1000.

3.9 Subtracting by Renaming Page 1

Student Book pages 92–93

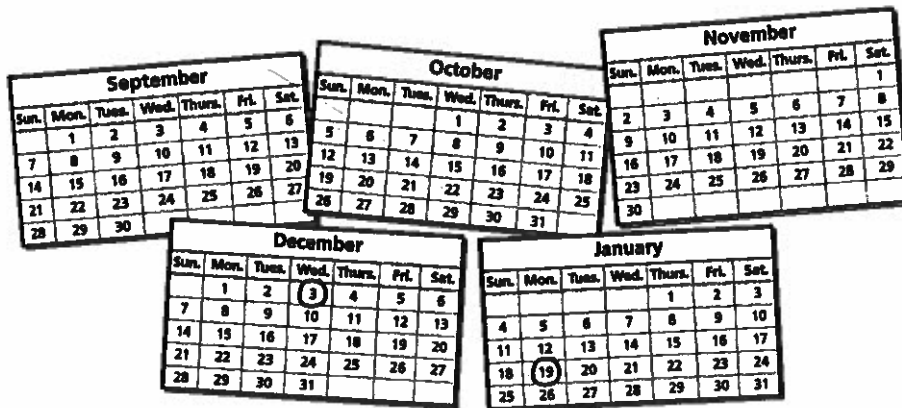
GOAL

Use renaming to make subtraction easier.

Problem

Vera's class is having a party on the 100th day of school.

Today is the 67th day of school.



How many days are there until the 100th day of school?

Subtract by renaming to solve the problem.

Step 1: Rename 100 as 99 + 1.

		9	9	+	1
		1	0	0	
-			6	7	
					=

Step 2: Subtract.

Step 3: Add 1 to the answer.

Hint: You need to add 1 because you renamed 100 as 99 + 1.

There are _____ days until the 100th day of school.

3.9 Subtracting by Renaming Page 2**Reflecting**

How does renaming make subtracting easier?

Write a subtraction question that you could solve by renaming the numbers first.

4. Estimate. Then calculate.

a) $1000 - 435$

 $1000 - 435$ is about _____.

$1000 - 435 =$ _____

b) $2000 - 435$

 $2000 - 435$ is about _____.

$2000 - 435 =$ _____

c) $3000 - 278$

 $3000 - 278$ is about _____.

$3000 - 278 =$ _____

Chapter 3
Lesson 9

Subtracting by Renaming

GOAL

Use renaming to make subtraction easier.

1. Estimate each difference.

- a) $2000 - 385$ is about _____
 b) $1000 - 197$ is about _____
 c) $3000 - 964$ is about _____
 d) $5000 - 331$ is about _____

2. Subtract by renaming.

a)

$$\begin{array}{r} 1000 \\ - 486 \\ \hline \end{array}$$

c)

$$\begin{array}{r} 4000 \\ - 865 \\ \hline \end{array}$$

b)

$$\begin{array}{r} 2000 \\ - 142 \\ \hline \end{array}$$

d)

$$\begin{array}{r} 3000 \\ - 298 \\ \hline \end{array}$$

3. Subtract.

a) $4000 - 721 =$ _____ c) $3000 - 307 =$ _____ e) $6000 - 214 =$ _____

b) $1000 - 192 =$ _____ d) $5000 - 536 =$ _____ f) $2000 - 1642 =$ _____

At-Home Help

To help you subtract, you can rename. For example:
 I want to know $4000 - 2864$.
 I can rename 4000 as $3999 + 1$
 to make it easier to subtract.

$$\begin{array}{r} 3999 + 1 \\ - 2864 \\ \hline 1135 + 1 = 1136 \end{array}$$

Subtracting in a Different Way

Goal Use regrouping to make subtraction easier.

1. Finish each subtraction.

a)
$$\begin{array}{r} 1999 + 1 \\ 2000 \\ - 655 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 2999 + 4 \\ 3003 \\ - 635 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 4999 + 2 \\ 5001 \\ - 1872 \\ \hline \end{array}$$

2. Estimate each difference. Then subtract.
Show your work.

a)
$$\begin{array}{r} 3000 \\ - 533 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 2005 \\ - 621 \\ \hline \end{array}$$

e)
$$\begin{array}{r} 1000 \\ - 807 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 2000 \\ - 1236 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 8000 \\ - 411 \\ \hline \end{array}$$

f)
$$\begin{array}{r} 5003 \\ - 1347 \\ \hline \end{array}$$

3. Correct any unreasonable answers.

a) $8000 - 178 = 7822$

b) $3000 - 488 = 2812$

At-Home Help

If the top number in a subtraction has many zeroes, you can regroup in 1 step.

$$\begin{array}{r} 1999 + 1 \\ 2000 \\ - 755 \\ \hline 1244 + 1 = 1245 \end{array}$$

The answer is reasonable because $2000 - 800 = 1200$ and 1245 is close to 1200.

Chapter 3: Addition and Subtraction

1. Calculate.

a) $23 + 45$

e) $78 - 9$

b) $39 + 223$

f) $65 - 27$

c) $367 + 33$

g) $741 - 36$

d) $459 + 259$

h) $543 - 372$

2. Ned has 16 pencil crayons. He needs 28 to fill his box.
How many more pencil crayons does he need?

3. Complete each number sentence.

a) $8 + \underline{\hspace{2cm}} = 15$

d) $\underline{\hspace{2cm}} + 12 = 80$

b) $29 + 16 = \underline{\hspace{2cm}}$

e) $99 + \underline{\hspace{2cm}} = 200$

c) $17 + \underline{\hspace{2cm}} = 29$

f) $77 - \underline{\hspace{2cm}} = 54$

4. The school long jump record is 485 cm. Eric jumped 369 cm. How much shorter was Eric's jump than the school record?

5. What is the missing number? Circle it.

$$\begin{array}{r} 4 \blacksquare 8 \\ + 179 \\ \hline 657 \end{array}$$

7 2 0 8

6. Calculate using mental math. Explain what you did.

a) $45 - 39 =$ _____

b) $98 - 97 =$ _____

c) $82 - 62 =$ _____

d) $81 - 73 =$ _____

7. Estimate, then calculate.

a) $38 + 92$ is about _____

c) $24 + 69$ is about _____

b) $92 - 38$ is about _____

d) $69 - 24$ is about _____