

**Student Guide**

**Subtraction (SG pp. 138–143)**

**Questions 1–17**

- Answers will vary. Possible response: Mrs. Haddad tried to subtract 7 from 4—that’s like trying to take 7 bits from 4 bits. So, she traded 1 ten or a skinny for ten ones. Then she had 14 ones or bits. That’s why she put a 1 in front of the 4 to make a 14. She had 5 tens or skinnies left, so she crossed out the 6 and wrote a 5 above it for the 5 skinnies. Then she can subtract 7 ones from 14 to get 7 in the ones place, 4 tens from 5 tens to get 1 in the tens place. Then she subtracted 100 from 300 and wrote a 2 in the hundreds place. The answer is 217.

For Questions 2–5, students first solve the problem with base-ten pieces or shorthand (A). Answers for B (using paper and pencil) are shown below.

- B.** 229 pieces of candy
- B.** 2725 pieces of candy
- B.** 2771 Chocos
- B.** No.  $5204 - 565 = 4639$  Chocos, so there is not enough candy for the customer to buy 4859 Chocos.
- |                |                 |                 |
|----------------|-----------------|-----------------|
| <b>A.*</b> 241 | <b>B.*</b> 1246 | <b>C.*</b> 216  |
| <b>D.*</b> 223 | <b>E.*</b> 3381 | <b>F.*</b> 3292 |
| <b>G.*</b> 175 | <b>H.*</b> 235  | <b>I.*</b> 1816 |

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Mrs. Haddad said, "I don't need a recording sheet to tell what the ones, tens, and hundreds are. I use place value. The first place from the right is always the ones place, the second place is always the tens place, and so on.

She solved the problem without a recording sheet like this:

$$\begin{array}{r} 3\cancel{0}7 \\ - 147 \\ \hline 217 \end{array}$$

- Explain Mrs. Haddad's method in your own words. How is it like using base-ten pieces?

Another day there were 1237 pieces of candy in the store. The store sold 459 pieces of candy that day. To find how much was left, Rhonda used Mrs. Haddad's method. Rhonda called this the compact method for subtraction.

$$\begin{array}{r} 12\cancel{3}7 \\ - 459 \\ \hline 8 \end{array}$$

Joe saw that he had to trade 1 skinny for 10 bits before he could subtract 9 bits. Next Joe subtracted 9 bits from 17 bits.

$$\begin{array}{r} 12\cancel{3}7 \\ - 459 \\ \hline 8 \end{array}$$

Joe then broke up one flat so that he had 12 skinnies and was able to subtract.

$$\begin{array}{r} 12\cancel{3}7 \\ - 459 \\ \hline 78 \end{array}$$

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At the next step, Joe broke up his only pack so that he had 11 flats. Joe found that there were 778 pieces of candy left in the store.

$$\begin{array}{r} 12\cancel{3}7 \\ - 459 \\ \hline 778 \end{array}$$

For problems 2–5:

- Use base-ten pieces or base-ten shorthand to solve the problem.
- Then, do the problem using paper and pencil.

- There were 578 pieces of candy in the store (5 flats, 7 skinnies, and 8 bits). The store sold 349 pieces of candy. How many pieces of candy were left?
- Another day there were 4443 pieces of candy, and 1718 of them were sold. How many pieces of candy were left?
- There are 2079 Chocos. How many more need to be made so the store has 4850 Chocos?
- There are 5204 Chocos. A customer came in and bought 565. Another customer came in and wanted to buy 4859 pieces of candy. Was there enough candy in the store so that he could buy that much?

Solve the following problems using paper and pencil.

- |   |  |  |
|---|--|--|
| <b>6. A.</b> $\begin{array}{r} 475 \\ -234 \end{array}$ | <b>B.</b> $\begin{array}{r} 1567 \\ -321 \end{array}$  | <b>C.</b> $\begin{array}{r} 541 \\ -325 \end{array}$   |
| <b>D.</b> $\begin{array}{r} 392 \\ -169 \end{array}$    | <b>E.</b> $\begin{array}{r} 5564 \\ -2183 \end{array}$ | <b>F.</b> $\begin{array}{r} 6053 \\ -2761 \end{array}$ |
| <b>G.</b> $\begin{array}{r} 563 \\ -388 \end{array}$    | <b>H.</b> $\begin{array}{r} 802 \\ -567 \end{array}$   | <b>I.</b> $\begin{array}{r} 3645 \\ -1829 \end{array}$ |

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\*Answers and/or discussion are included in the lesson.

7. **A.** correct:  $45 + 547 = 592$   
**B.** incorrect:  $759 + 218 = 977$  instead of 967; correct answer is 208  
**C.** correct:  $1156 + 6964 = 8120$
8. **A.** Yes,  $267 = 200 + 60 + 7$ . Possible response: I checked with my base-ten pieces.  
**B.**  $100 + 20 + 3$  is what is left when 144 is taken away from 267.  
 $200 - 100 = 100$ ;  $60 - 40 = 20$  and  $7 - 4 = 3$ . So,  $100 + 20 + 3 = 123$
9. **A.** Yes,  $356 = 300 + 50 + 6$ . Possible response: I added the numbers together.  
**B.** He needed to trade or regroup because he could not subtract 80 from 50 or 7 from 6 bits. So he regrouped. If I think about base-ten pieces, he moved 100 (1 flat or 10 skinnies) and 10 (1 skinny or 10 bits).  
**C.** Yes,  $356 = 200 + 140 + 16$ . Possible response: I added the numbers together.  
**D.** John subtracted 100 (1 flat) from 200 and 80 (8 skinnies) from 140 and 7 (7 bits) from 16 to get  $100 + 60 + 9$ . He then added these numbers together to get 169.

10. **A.** 
$$\begin{array}{r} 475 = 400 + 70 + 5 \\ - 243 = 200 + 40 + 3 \\ \hline 200 + 30 + 2 = 232 \end{array}$$

**B.** 
$$\begin{array}{r} 561 = 500 + \overset{50}{\cancel{60}} + \overset{11}{\cancel{1}} \\ - 327 = 300 + 20 + 7 \\ \hline 200 + 30 + 4 = 234 \end{array}$$

**C.** 
$$\begin{array}{r} 2541 = \overset{1000}{\cancel{2000}} + \overset{1500}{\cancel{500}} + \overset{30}{\cancel{40}} + \overset{11}{\cancel{1}} \\ - 825 = \phantom{2000} + 800 + 20 + 5 \\ \hline 1000 + 700 + 10 + 6 = 1716 \end{array}$$

**Checking Your Work with Addition**

"I know I sometimes make mistakes when I subtract. So I want a good way to check my answers," said Maruta.

"I use addition to check," said Sara. "In a subtraction problem, I start with a number and subtract something. If I add back what I subtracted, I should get back the number that I started with. If I don't, I must have made a mistake."

Maruta used Sara's method to check her answer to  $721 - 293$ . Her answer was 572.

$$\begin{array}{r} 721 \\ -293 \\ \hline \text{Answer } 572 \end{array}$$

She used addition to check her answer.

$$\begin{array}{r} 721 \\ -293 \\ \hline \text{Answer } 572 \\ \text{Check } 865 \end{array} \quad \begin{array}{l} \text{Adding these two numbers should give} \\ \text{721, the number Maruta started with.} \\ 293 \\ +572 \\ \hline 865, \text{ not } 721 \\ \text{Instead she got 865 when she added.} \\ \text{Maruta must have made a mistake.} \end{array}$$

7. Maruta used addition to check these answers. Which are correct and which are incorrect? Tell how you know.

|           |   |           |  |           |  |
|-----------|---|-----------|--|-----------|--|
| <b>A.</b> | $\begin{array}{r} 592 \\ -45 \\ \hline \text{Answer } 547 \\ \text{Check } 592 \end{array}$ | <b>B.</b> | $\begin{array}{r} 967 \\ -759 \\ \hline \text{Answer } 218 \\ \text{Check } 977 \end{array}$ | <b>C.</b> | $\begin{array}{r} 8120 \\ -1156 \\ \hline \text{Answer } 6964 \\ \text{Check } 8120 \end{array}$ |
|-----------|---|-----------|--|-----------|--|

Solve the subtraction problems in the *Checking with Addition* pages of your *Student Activity Book*. Use addition to check your answers.

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**Using Expanded Form**

"One way we showed our work when we added was to use expanded form," said Rhonda. "We can use expanded form to show subtraction too."

Rhonda's solution:

$$\begin{array}{l} 267 = 200 + 60 + 7 \\ \text{Subtract: } 144 = 100 + 40 + 4 \\ \hline 100 + 20 + 3 = 123 \end{array}$$

- A.** Look at Rhonda's work. Is she correct that  $267 = 200 + 60 + 7$ ? How do you know?  
**B.** Why did Rhonda write  $100 + 20 + 3$  in her answer? Explain how she got each number.

John solved a problem that had trades:

$$\begin{array}{l} 356 = \overset{200}{\cancel{300}} + \overset{140}{\cancel{50}} + \overset{16}{\cancel{6}} \\ \text{Subtract: } 187 = 100 + 80 + 7 \\ \hline 100 + 60 + 9 = 179 \end{array}$$

- A.** Look at John's work. Is he correct that  $356 = 300 + 50 + 6$ ? How do you know?  
**B.** Why did John change  $300 + 50 + 6$  to  $200 + 140 + 16$ ?  
**C.** Is he correct that  $356 = 200 + 140 + 16$ ? How do you know?  
**D.** Why did John write  $100 + 60 + 9$ ? Explain how he got each number.

10. Solve these problems using expanded form:

|           |  |           |  |           |   |
|-----------|--|-----------|--|-----------|---|
| <b>A.</b> | $\begin{array}{r} 475 \\ -243 \\ \hline \end{array}$ | <b>B.</b> | $\begin{array}{r} 561 \\ -327 \\ \hline \end{array}$ | <b>C.</b> | $\begin{array}{r} 2541 \\ -825 \\ \hline \end{array}$ |
|-----------|--|-----------|--|-----------|---|

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Using Mental Math to Subtract

11. Talk with a partner about the following subtraction problems. Discuss which problems are easy and which are hard. Which would you solve with mental math and which would you solve with paper and pencil?
- A.  $101 - 2$       B.  $238 - 72$       C.  $3004 - 2999$   
 D.  $375 - 125$       E.  $54 - 34$       F.  $602 - 593$   
 G.  $487 - 256$       H.  $381 - 200$       I.  $52 - 25$   
 J.  $150 - 30$       K.  $91 - 21$       L.  $826 - 487$
12. Choose two problems from Question 11. Be prepared to tell the class how you would solve them mentally.

Mrs. Dewey's class talked about how they solved the problem  $75 - 38$  using mental math. Some students counted back and other students counted up.

"To subtract 38, I took away 30 first.  $75 - 30 = 45$ . Then I took away 8 more.  $45 - 8 = 37$ . I thought about hops on a number line."

"I changed the problem to a simpler one. It is easier to subtract 40 than it is to subtract 38. First, I subtracted 40 but that was too much so I added back 2."

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Counting Back to Solve  $75 - 38$ :

"I started at 38 and counted up to 75. I thought about a number line."

"I counted up too. I thought about what I would add to get to 75."  
 $38 + 2 = 40$      $40 + 30 = 70$      $70 + 5 = 75$   
 My answer is  $2 + 30 + 5 = 37$

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Counting Up to Solve  $75 - 38$ :

13. Solve the following problems mentally. Use either Ana's, Jerome's, Tanya's, or Sara's strategy. Talk with a partner about your solutions. Be ready to discuss your solutions with the class. Use at least two different methods.
- A.  $63 - 29$       B.  $125 - 94$       C.  $286 - 85$       D.  $5008 - 4995$

Check-In: Questions 14-17

14. Solve using any strategy or method you wish. You can refer to the *Subtraction Strategies Menu* in your *Student Activity Book*. Show your strategy and how you checked your answer.
- A.  $\begin{array}{r} 483 \\ -176 \\ \hline \end{array}$       B.  $\begin{array}{r} 302 \\ -197 \\ \hline \end{array}$       C.  $\begin{array}{r} 3428 \\ -562 \\ \hline \end{array}$
15. Choose one problem from Question 14 to solve using a mental math strategy. Explain your thinking.
16. Joe had 236 Chocos to sell on Wednesday. At the end of the day he had 144. How many Chocos did Joe sell on Wednesday? Solve using expanded form.
17. Solve  $238 - 67$  using base-ten pieces and a recording sheet.

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11. Methods will vary. One possible response is given for each.

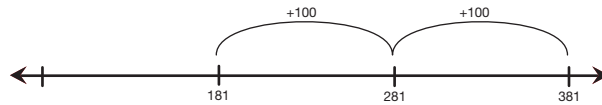
- A. 99; mental math: count back 2 from 101, 100, 99.  
 B. 166; pencil and paper  
 C. 5; mental math: count up 5 from 2999 to 3004  
 D. 250; mental math: think of money \$3.75 take away a quarter and a dollar; \$2.50  
 E. 20; mental math: count back 2 tens  
 F. 9; mental math

$$593 + 7 = 600$$

$$600 + 2 = 602$$

$$7 + 2 = 9$$

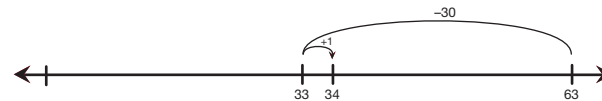
- G. 231; mental math: no trades are needed, so subtract hundreds, then tens, then ones.  
 H. 181; mental math: think of a number line.



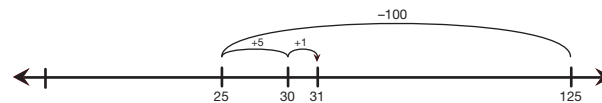
- I. 27; mental math:  $50 - 25 = 25$  and add on the 2 for 27  
 J. 120; mental math: 15 tens - 3 tens is 12 tens or 120  
 K. 70; mental math:  $90 - 20 = 70$ ,  $1 - 1 = 0$   
 L. 339; pencil and paper

12. Answers will vary. See possible strategies above for Question 11.  
 13. Strategies will vary. One solution is shown for each.

- A. 34; Subtract 30 from 63 to get 33, then add back in 1.



- B. 31; Subtract 100 from 125 to get 25, then add back in 6 to get 31.



- C. 201;  $86 - 85 = 1$ , then add in the 200 to get 201  
 D. 13; count up from 4995

$$4995 + 5 = 5000$$

$$5000 + 8 = 5008$$

$$5 + 8 = 13$$

14. Strategies will vary. One possible response is given for each.

A. 

|    |   |    |   |
|----|---|----|---|
| □  |   |    | • |
| 4  | 8 | 3  |   |
| 4  | 7 | 13 |   |
| -1 | 7 | 6  |   |
| 3  | 0 | 7  |   |

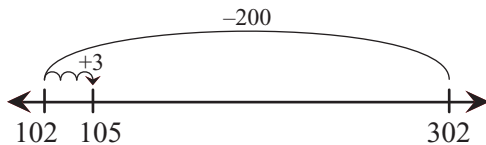
 Check  $\begin{array}{r} 307 \\ + 176 \\ \hline 483 \end{array}$

B.  $\begin{array}{r} 302 \\ - 197 \\ \hline 105 \end{array}$   $\begin{array}{r} 299 \\ - 197 \\ \hline 102 \end{array}$   $102 + 3 = 105$  Check  $\begin{array}{r} 197 \\ + 105 \\ \hline 302 \end{array}$

C.  $\begin{array}{r} 231 \\ 3428 \\ - 562 \\ \hline 2866 \end{array}$  Check  $\begin{array}{r} 11 \\ 2866 \\ + 562 \\ \hline 3428 \end{array}$

15. Possible response for 14B:

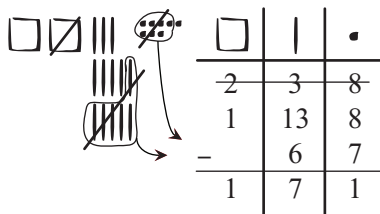
$\begin{array}{r} 302 \\ - 197 \\ \hline 105 \end{array}$   $\begin{array}{r} 302 \\ - 200 \\ \hline 102 \end{array}$   $102 + 3 = 105$



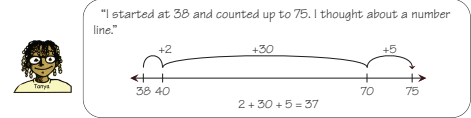
16.

$\begin{array}{r} 236 \\ - 144 \\ \hline 92 \end{array}$   $\begin{array}{r} 100 \\ 200 \\ + 130 \\ 30 \\ + 6 \\ \hline 100 + 40 + 4 \\ 0 + 90 + 2 = 92 \end{array}$

17.



Counting Back to Solve 75 - 38:



"I counted up too. I thought about what I would add to get to 75."  $38 + (2) = 40$   $40 + (30) = 70$   $70 + (5) = 75$  My answer is  $2 + 30 + 5 = 37$



Counting Up to Solve 75 - 38:

13. Solve the following problems mentally. Use either Ana's, Jerome's, Tanya's, or Sara's strategy. Talk with a partner about your solutions. Be ready to discuss your solutions with the class. Use at least two different methods.

- A.  $63 - 29$  B.  $125 - 94$  C.  $286 - 85$  D.  $5008 - 4995$

Check-In: Questions 14-17

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- A.  $\begin{array}{r} 483 \\ - 176 \\ \hline \end{array}$  B.  $\begin{array}{r} 302 \\ - 197 \\ \hline \end{array}$  C.  $\begin{array}{r} 3428 \\ - 562 \\ \hline \end{array}$

15. Choose one problem from Question 14 to solve using a mental strategy. Explain your thinking.

16. Joe had 236 Chocos to sell on Wednesday. At the end of the day he had 144. How many Chocos did Joe sell on Wednesday? Solve using expanded form.

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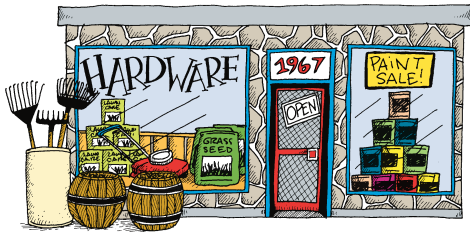
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**Homework**

Answer the following questions about the hardware store. Show your work.

- The hardware store has 576 drywall nails and 852 wood nails. How many drywall and wood nails does the store have altogether?
- The hardware store has 217 cans of varnish. The store sold 89. How many are left?
- The hardware store sells seed packets. It has 1145 vegetable seed packets and 2356 flower seed packets.
  - Estimate the total number of seed packets in the store.
  - Find the exact number of seed packets in the store.
- The hardware store has 672 gallon cans of white indoor paint and 743 gallon cans of white outdoor paint. How many cans of white paint does the store have altogether?
- The hardware store has 260 gallon cans of glossy white paint and 240 quart cans of glossy white paint.
  - How many gallons is 240 quarts? Remember, there are 4 quarts in one gallon.
  - What is the total amount in gallons of glossy white paint in the store?
- Frank buys a 2025-foot roll of string. He cuts off 215 feet for his kite. How many feet are left on the roll?



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- A gardener goes to the hardware store to buy some bags of grass seed. He buys 2 large bags and 1 small bag. A large bag of grass seed covers about 3275 square feet. A small bag covers about 1770 square feet. About how many square feet of grass will the bags cover?
- The hardware store sold 25 bags of seed on Monday, 32 on Tuesday, 11 on Wednesday, 9 on Thursday, and 41 on Friday. The hardware store then sold 197 bags of seed over the weekend.
  - How many bags of seed did the hardware store sell from Monday to Friday?
  - How many bags of seed did the hardware store sell all week?
  - Did the hardware store sell more seeds from Monday to Friday or over the weekend?
  - How many more bags of seed did the hardware store sell over the weekend than during the week?

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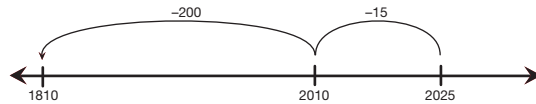
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Homework (SG pp. 144–145)

Questions 1–8

Strategies will vary. One possible response is given for each.

- 1428 nails;  $576 + 852 = 1428$  nails
- 128 cans;  $217 - 100 = 117$ ,  $117 + 11 = 128$  cans
- About 3500 seed packets;  $1100 + 2400 = 3500$  seed packets
  - 3501 seed packets;  $1145 + 2356 = 3501$  seed packets
- 1415 cans of paint;  $672 + 743 = 1415$  cans
- 60 quarts;  $240 \div 4 = 60$  quarts
  - 320 gallons;  $260 + 60 = 320$  gallons
- 1810 feet; count back



- Answers will vary. Possible response: About 8400 square feet;  $3300 + 3300 = 6600$ ,  $6600 + 1800 = 8400$  square feet
- 118 bags of seed;  $25 + 32 + 11 + 9 + 41 = 57 + 11 + 50 = 68 + 50 = 118$  bags
  - 315 bags of seed;  $118 + 197 = 118 + 200 - 3 = 318 - 3 = 315$  bags
  - The hardware store sold more seeds over the weekend.
  - 79; count up;

$$118 + \textcircled{2} = 120$$

$$120 + \textcircled{70} = 190$$

$$190 + \textcircled{7} = 197$$

$$2 + 70 + 7 = 79$$

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