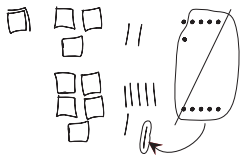
1. On another day, Rhonda made 1326 candies and Joe made 565. Rhonda recorded their work by sketching the base-ten pieces using base-ten shorthand. Use your base-ten pieces to solve this problem.

1326
+ 565



Joe remembered the Fewest Pieces Rule and wrote:

Thousands	Hundreds	Tens	Ones
1	3	2	6
+	5	6	5
1	8	8 1	~~11~~
1	8	9	1

Fewest Pieces

A. Why did Joe draw a line through the 11?
B. What does the small "1" mean next to the 8 in the tens column?
C. Why did Joe change the 8 to a 9 in his answer?

2. At the end of one day, Rhonda had made 946 candies and Joe had made 966. How many candies do they have altogether?

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3. Rhonda and Joe decided to find their total using paper-and-pencil methods instead of showing their work with base-ten pieces. Rhonda used the **expanded form method.**

$$\begin{array}{r} 946 = 900 + 40 + 6 \\ +\ 966 = 900 + 60 + 6 \\ \hline 1800 + 100 + 12 = 1900 + 12 = 1912 \end{array}$$

A. Look at Rhonda's work. Is she correct that 946 = 900 + 40 + 6 ?
B. Why did Rhonda write 1800 + 100 + 12 in her answer?
C. Explain how she got each number.
D. Can you explain how Rhonda got 1900 + 12 and then 1912?

4. Solve these problems using Rhonda's method, the expanded-form method.
A. 68 + 73 **B.** 386 + 92 **C.** 519 + 368 **D.** 1254 + 3168

5. Joe used the **all-partials paper-and-pencil method** to find the number of candies Rhonda and Joe had altogether.

$$\begin{array}{r} 946 \\ +\ 966 \\ \hline 12 \\ 100 \\ 1800 \\ \hline 1912 \end{array}$$

A. Look at the steps in Joe's work. Can you explain why Joe wrote 12? Why did he write 100? Where did the 1800 come from?
B. Can you tell how the steps in Joe's work are like Rhonda's method? What is the same? What is different?

6. Solve these problems using Joe's method, the all-partials paper-and-pencil method.
A. 37 + 84 **B.** 85 + 243 **C.** 662 + 219 **D.** 2579 + 4366

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Questions 1–20 (SG pp. 129–134)

1. A–C.* Answers will vary. Joe drew the line through the 11 to show he was trading 10 bits for a skinny, i.e., 10 ones for a ten. The small "1" means another ten has been added to the tens column. Joe changed the 8 to a 9 because he added one more ten: 8 tens plus 1 ten is 9 tens.

2. 1912 candies

3. A.* Yes, Rhonda is correct.

B–C.* The 1800 was from adding 900 + 900, the 100 was from adding 40 + 60, and the 12 was from adding 6 + 6.

D.* Rhonda first added 1800 + 100 to get 1900. Then she added 1900 + 12 to get 1912.

4. A.* 141;
$$\begin{array}{r} 68 = 60 + 8 \\ +\ 73 = 70 + 3 \\ \hline 130 + 11 = 141 \end{array}$$

B.* 478;
$$\begin{array}{r} 386 = 300 + 80 + 6 \\ +\ 92 = \quad 90 + 2 \\ \hline 300 + 170 + 8 = 478 \end{array}$$

C.* 887;
$$\begin{array}{r} 519 = 500 + 10 + 9 \\ +\ 368 = 300 + 60 + 8 \\ \hline 800 + 70 + 17 = 887 \end{array}$$

D.* 4422;
$$\begin{array}{r} 1254 = 1000 + 200 + 50 + 4 \\ +\ 3168 = 3000 + 100 + 60 + 8 \\ \hline 4000 + 300 + 110 + 12 = 4422 \end{array}$$

5. A. Answers will vary. Joe wrote 12 because it is the sum of 6 + 6. 100 is the sum of 40 + 60. 1800 is the sum of 900 + 900.

B. Both methods add the ones, tens, and hundreds separately, then add the sums. In Joe's way, the expanded form of the number is kept in his head. The sums are added vertically.

6. A. 121;
$$\begin{array}{r} 37 \\ +\ 84 \\ \hline 110 \\ 11 \\ \hline 121 \end{array}$$

B. 328;
$$\begin{array}{r} 85 \\ +\ 243 \\ \hline 200 \\ 120 \\ 8 \\ \hline 328 \end{array}$$

C. 881;
$$\begin{array}{r} 662 \\ +\ 219 \\ \hline 800 \\ 70 \\ 11 \\ \hline 881 \end{array}$$

D. 6945;
$$\begin{array}{r} 2579 \\ +\ 4366 \\ \hline 15 \\ 130 \\ 800 \\ 6000 \\ \hline 6945 \end{array}$$

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

7. A. Answers will vary.

B. Mrs. Haddad wrote the two small ones to show her trades. The one above the 4 means she had traded 10 ones for a ten. The one over the 9 means she had traded 10 tens for a hundred.

C. She would use a skinny for over the 4 and a flat for over the 9.

8. A. 94 **B.** 501

C. 585 **D.** 632

9. A. 1660 students

B. Methods will vary. Possible responses:

Maya's solution:
$$\begin{array}{r} {\scriptstyle 1\,1}\\ 765\\ +\ 895\\ \hline 1660 \end{array}$$

C. John's solution:
$$895 + 5 = 900$$
$$900 + 60 = 960$$
$$960 + 700 = 1660$$

D. Answers will vary.

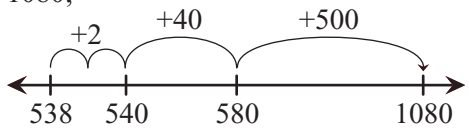
10. Methods will vary. One appropriate method is given for each.

A. 285; $200 + 83 = 283$
$283 + 2 = 285$

B. 601; $425 + 1 + 100 + 75 =$
$400 + 100 + (25 + 75) + 1 = 601$

C. 539;
$$\begin{array}{r} {\scriptstyle 1}\\ 293\\ +\ 246\\ \hline 539 \end{array}$$

D. 1080;



11. See A, B, and D above.

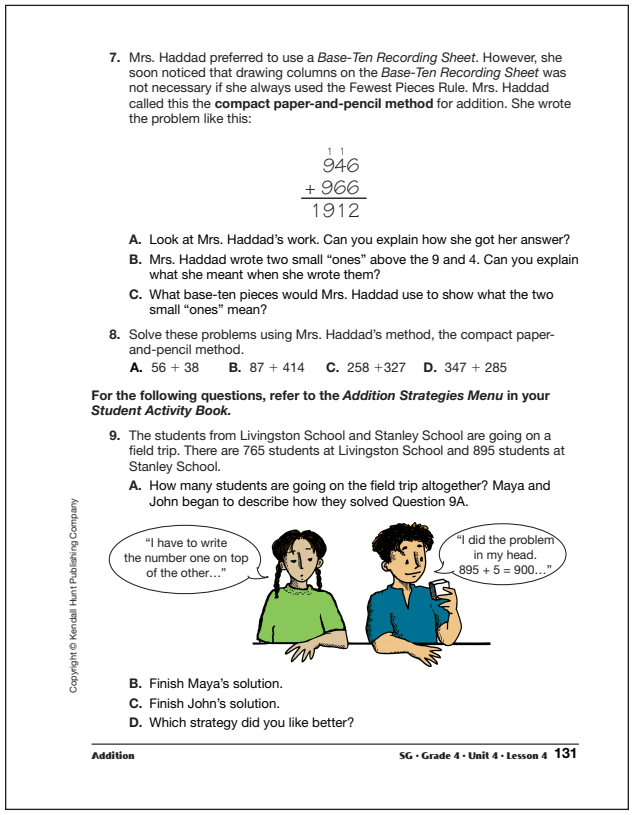
12. A. 460; $405 + 55 =$
$400 + 5 + 55 = 460$

B. 502; $227 + 275 =$
$225 + 2 + 275 =$
$200 + 2 + 200 + 100 = 502$

C. 965; $567 + 398 =$
$567 + 400 - 2 =$
$967 - 2 = 965$

D. 360; $178 + 182 =$

13. 2703; $1698 + 1005 = 1698 + 1000 + 5 = 2703$



7. Mrs. Haddad preferred to use a *Base-Ten Recording Sheet*. However, she soon noticed that drawing columns on the *Base-Ten Recording Sheet* was not necessary if she always used the Fewest Pieces Rule. Mrs. Haddad called this the **compact paper-and-pencil method** for addition. She wrote the problem like this:

$$\begin{array}{r} {\scriptstyle 1\,1}\\ 946\\ +\ 966\\ \hline 1912 \end{array}$$

A. Look at Mrs. Haddad's work. Can you explain how she got her answer?
B. Mrs. Haddad wrote two small "ones" above the 9 and 4. Can you explain what she meant when she wrote them?
C. What base-ten pieces would Mrs. Haddad use to show what the two small "ones" mean?

8. Solve these problems using Mrs. Haddad's method, the compact paper-and-pencil method.
A. 56 + 38 B. 87 + 414 C. 258 +327 D. 347 + 285

For the following questions, refer to the *Addition Strategies Menu* in your *Student Activity Book*.

9. The students from Livingston School and Stanley School are going on a field trip. There are 765 students at Livingston School and 895 students at Stanley School.
A. How many students are going on the field trip altogether? Maya and John began to describe how they solved Question 9A.

B. Finish Maya's solution.
C. Finish John's solution.
D. Which strategy did you like better?

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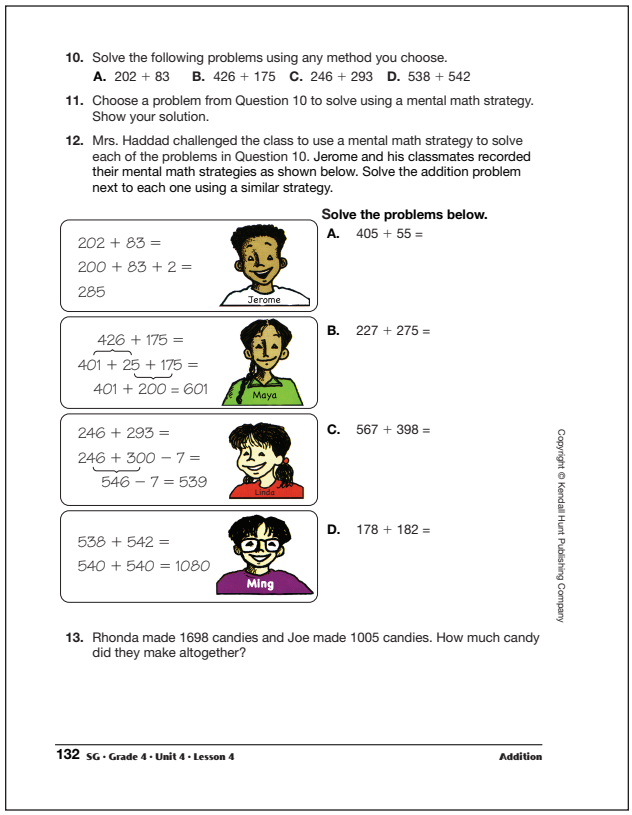

10. Solve the following problems using any method you choose.
A. 202 + 83 B. 426 + 175 C. 246 + 293 D. 538 + 542

11. Choose a problem from Question 10 to solve using a mental math strategy. Show your solution.

12. Mrs. Haddad challenged the class to use a mental math strategy to solve each of the problems in Question 10. Jerome and his classmates recorded their mental math strategies as shown below. Solve the addition problem next to each one using a similar strategy.

Solve the problems below.

Jerome: $202 + 83 =$ / $200 + 83 + 2 =$ / 285
A. $405 + 55 =$

Maya: $426 + 175 =$ / $401 + 25 + 175 =$ / $401 + 200 = 601$
B. $227 + 275 =$

Linda: $246 + 293 =$ / $246 + 300 - 7 =$ / $546 - 7 = 539$
C. $567 + 398 =$

Ming: $538 + 542 =$ / $540 + 540 = 1080$
D. $178 + 182 =$

13. Rhonda made 1698 candies and Joe made 1005 candies. How much candy did they make altogether?

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14. Rhonda and Joe solved Question 13 differently.

Rhonda's solution:

1698 + 5 = 1703
1703 + 1000 = 2703

Joe's Solution:

1698
+ 1005
2000
600
90
13
2703

A. Look at their solutions. Which strategy could you do in your head or with a few notes?

B. Which strategy do you like better?

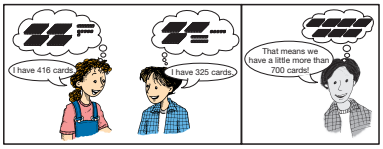
Using Base-Ten Pieces to Estimate

Grace has 325 baseball cards. Her sister Rosie has 416. Rosie said, "Together we have more than 1000 baseball cards!"

Grace disagreed. She said, "I think we only have a little more than 700 baseball cards all together."

Which girl has the more reasonable estimate?

Thinking about base-ten pieces is one good way to estimate. Grace has 3 flats and some skinnies and bits. Rosie has 4 flats and some skinnies and bits. That's 7 flats, and some more.



15. Ming has a collection of 225 stickers and Shannon has a collection of 247 stickers.

Ming and Shannon combined their collections.

Ming said, "Together we have more than 500 stickers."

Shannon said, "Together we have less than 500 stickers."

Who has the more reasonable estimate? Tell how you know.

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16. For each problem, tell if the statement reflects a reasonable estimate or not.

A. 565 + 221 is more than 1000.

B. 234 + 735 is less than 1000.

C. 159 + 202 is more than 400.

D. 787 + 295 is less than 1000.

E. 125 + 195 is more than 500.

✓ Check-In: Questions 17-20

17. Solve the following problems. Use any method you choose.

A. 4234 + 246 **B.** 7003 + 537 **C.** 646 + 254

18. Choose a problem from Question 17 to solve using a mental math strategy.

19. The TIMS Candy Factory needed 1000 candies to be made by Tuesday evening. Using estimation, did Joe and Rhonda make enough candy Monday and Tuesday? Explain how you found your answer.

Candies Made

	Monday	Tuesday
Rhonda	546	197
Joe	232	125

20. Use base-ten pieces to find the number of candies Rhonda and Joe made on Tuesday.

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14. A. Rhonda's solution.

B. Responses will vary.

15. Shannon has the more reasonable estimate. Both collection have less than 250 stickers. 250 + 250 = 500

16. A. Not reasonable

B. Reasonable

C. Not reasonable

D. Not reasonable

E. Not reasonable

17. Strategies will vary.

A. 4480;
$$\begin{array}{r} 4234 \\ +\ 246 \\ \hline 4000 \\ 400 \\ 70 \\ 10 \\ \hline 4480 \end{array}$$

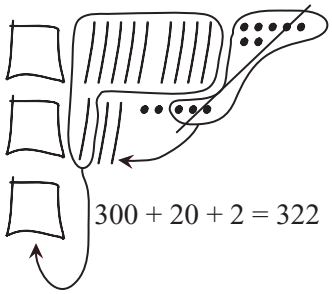
B. 7540; 537 + 3 + 7000 = 540 + 7000 = 7540

C.
$$\begin{array}{rcl} 646 & = & 600 + 40 + 6 \\ +\ 254 & = & 200 + 50 + 4 \end{array}$$

18. Responses will vary. For C:
646 + 254 =
646 + 4 + 250 =
650 + 250 = 900

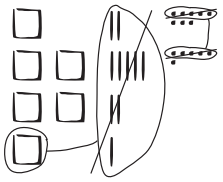
19. Yes; I counted the hundreds (500 + 200 + 200 + 100) and counted more than 1000 candies.

20. 322; 197 + 125



Student Guide

Homework (SG pp. 135–136)

1. 

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 128 \\ +\ 476 \\ \hline 604 \end{array}$$

$$\begin{array}{r} 100 + 20 + 8 \\ 400 + 70 + 6 \\ \hline 500 + 90 + 14 = 604 \end{array}$$

2. Methods will vary.

A. 489

B. 500

C. 4385

3. A. 1067 candies

B. 2050 candies

C. Answers will vary. Possible response: add 1000 + 1000 = 2000; then add 3 + 47 = 50; 2000 + 50 = 2050 candies.

D. 1332 candies

E. Methods will vary. Using friendly numbers: 500 + 1000 + 600 = 2100

F. Methods will vary. 600 + 1000 + 800 = 2400 pieces

G. Methods will vary. Using the answers in E and F, 2100 + 2400 = 4500 pieces.

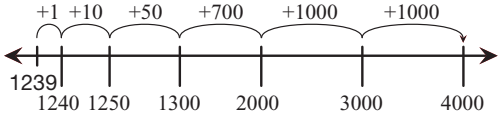
4. A. 2885

B. 2433

C. 5882

5. Possible response for B: 2000 + 432 + 1 = 2433

6. 2761 soup labels. Strategies will vary. A possible response: add 487 + 752 = 1239 labels. Then count up on the number line.



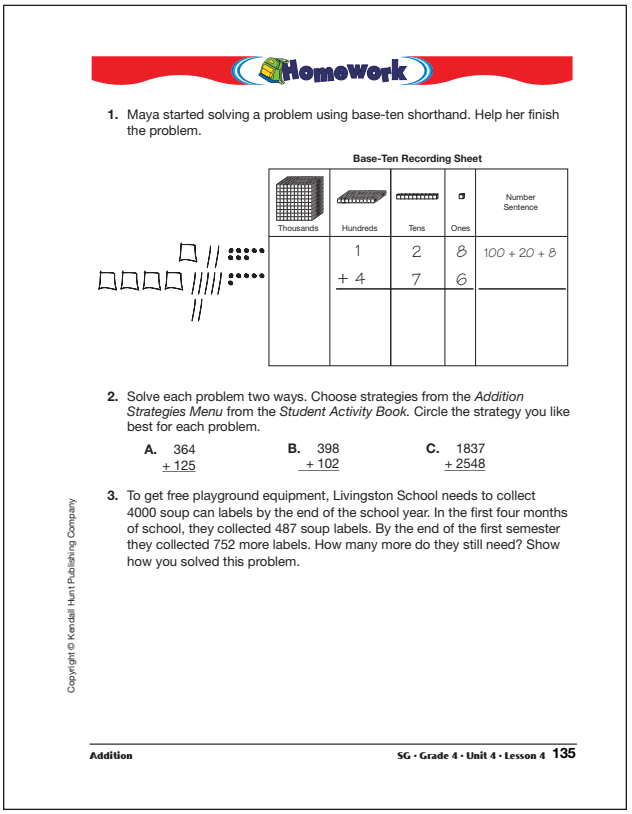
7. A. $n = 50$

B. $n = 40$

C. $n = 30$

D. $n = 24$

E. $n = 37$



Homework

1. Maya started solving a problem using base-ten shorthand. Help her finish the problem.

Base-Ten Recording Sheet

Thousands	Hundreds	Tens	Ones	Number Sentence
	1	2	8	100 + 20 + 8
	+ 4	7	6	

2. Solve each problem two ways. Choose strategies from the *Addition Strategies Menu* from the *Student Activity Book*. Circle the strategy you like best for each problem.

A. 364 + 125 **B.** 398 + 102 **C.** 1837 + 2548

3. To get free playground equipment, Livingston School needs to collect 4000 soup can labels by the end of the school year. In the first four months of school, they collected 487 soup labels. By the end of the first semester they collected 752 more labels. How many more do they still need? Show how you solved this problem.

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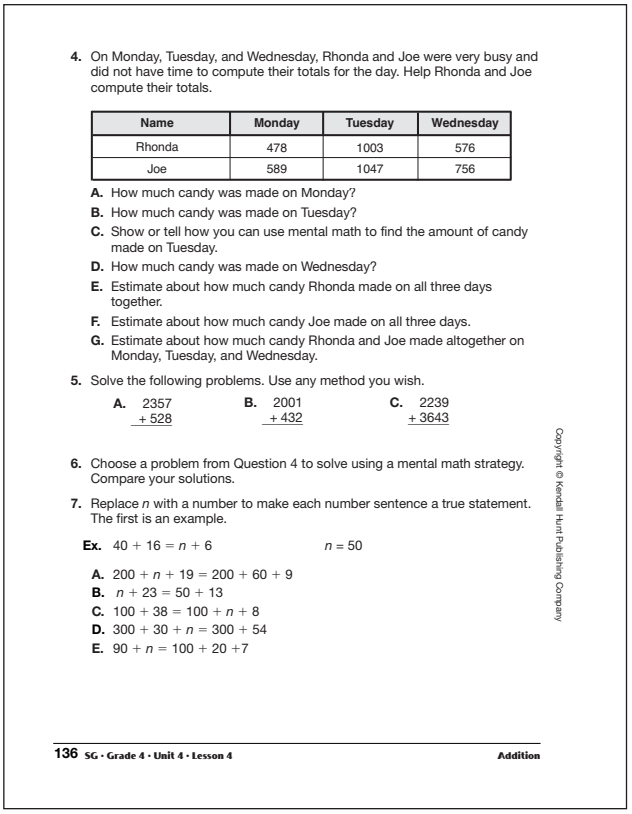

4. On Monday, Tuesday, and Wednesday, Rhonda and Joe were very busy and did not have time to compute their totals for the day. Help Rhonda and Joe compute their totals.

Name	Monday	Tuesday	Wednesday
Rhonda	478	1003	576
Joe	589	1047	756

A. How much candy was made on Monday?
B. How much candy was made on Tuesday?
C. Show or tell how you can use mental math to find the amount of candy made on Tuesday.
D. How much candy was made on Wednesday?
E. Estimate about how much candy Rhonda made on all three days together.
F. Estimate about how much candy Joe made on all three days.
G. Estimate about how much candy Rhonda and Joe made altogether on Monday, Tuesday, and Wednesday.

5. Solve the following problems. Use any method you wish.

A. 2357 + 528 **B.** 2001 + 432 **C.** 2239 + 3643

6. Choose a problem from Question 4 to solve using a mental math strategy. Compare your solutions.

7. Replace *n* with a number to make each number sentence a true statement. The first is an example.

Ex. 40 + 16 = *n* + 6 *n* = 50

A. 200 + *n* + 19 = 200 + 60 + 9
B. *n* + 23 = 50 + 13
C. 100 + 38 = 100 + *n* + 8
D. 300 + 30 + *n* = 300 + 54
E. 90 + *n* = 100 + 20 +7

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Name _____ Date _____

Place Value and Addition Quiz

1. Sketch 2782 using base-ten shorthand.

2. Solve this problem using base-ten pieces or a number line.

435
+ 298

3. Solve this problem using a paper-and-pencil method and a mental math strategy. Circle the strategy you think is the best choice for this problem. Explain your choice.

702
+ 258

4. Explain an estimation strategy that shows that your answer to Question 3 is reasonable.

5. Solve this problem using a different paper-and-pencil method than you used in Question 3.

277
+ 358

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Name _____ Date _____

6. Solve these problems using paper-and-pencil methods.

A. 403
+ 117

B. 2498
+ 512

7. Choose one of the problems in Question 6 and show how it can be solved using mental math.

8. Ana solved this problem using the all-partials paper-and-pencil method. Explain Ana's step shown by the arrow.

769
+ 158
17
110 ←
800
927

9. Explain an estimation strategy that shows that Ana's answer to Question 8 is reasonable.

Place Value and Addition Quiz Feedback Box

Expectation	Check In	Comments
Show partitions of numbers using base-ten shorthand. [Q#1]	E1		
Represent and solve an addition problem using base-ten pieces or a number line. [Q#2]	E2		
Solve addition problems using mental math. [Q#3, 7]	E4		
Add using paper-and-pencil methods. [Q#3, 5, 6, 8]	E6		
Choose appropriately from mental math and paper-and-pencil methods to add. [Q# 3, 5]	E9		
Estimate sums. [Q# 4, 9]	E11		

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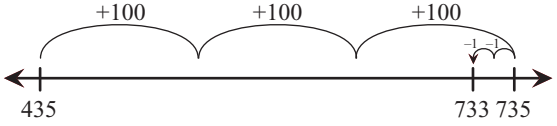
Teacher Guide

Place Value and Addition Quiz Questions 1–9 (TG pp. 1–2)

1. 

2. 733. Strategies may vary.



3. 960. Strategies may vary.

```
  702
+ 258
   10
   50
  900
  960
```

702 + 258 =
700 + 260 = 960

Possible explanation: I like the mental math strategy, because I can do part of the problem in my head.

4. Possible explanation: I thought about base-ten pieces. 7 hundreds and 2 hundreds plus about 50 is about 950. 960 is close to 950, so my answer is probably reasonable.

5. Possible method:

635; 277 = 200 + 70 + 7
+ 358 = 300 + 50 + 8
500 + 120 + 15 = 635

6. **A.** 520. Methods may vary.

```
  403
+ 117
  500
   10
+  10
  520
```

B. 3010; methods may vary.

```
  111
 2498
+ 512
 3010
```

7. 403 + 117
17 + 3 = 20
400 + 100 = 500
500 + 20 = 520

or

2498 + 512 =
2500 + 510 = 3010

8. Ana added 60 + 50 to get 110.

9. If I think about base-ten pieces, there are more than 9 flats or 900. So, 927 is reasonable.