

Student Guide

**Addition with Larger Numbers
(SG pp. 140–144)
Questions 1–11**

1. * 945

Addition with Larger Numbers

Nikia and Maruta work at the TIMS Candy Company. On Monday, Nikia made 678 Chocos. Maruta made 267 Chocos. They used base-ten pieces to help find the amount of candy they made altogether.

First they showed each number with base-ten pieces:



They combined the pieces to show addition:



Nikia used a base-ten recording sheet to record their work with the pieces. Tom looked at her work.



	1000s	100s	10s	1s
		6	7	8
+		2	6	7
		8	13	15

81315 Chocos! That cannot be right. Nobody could make that many pieces in one day. When I estimate, about 950 Chocos is more reasonable.

You cannot get the total by writing down all the numbers from the recording sheet. You have to use the Fewest Pieces Rule first. That will give you the number in standard form.



Nikia

1. Use the Fewest Pieces Rule to find the total number of Chocos Nikia and Maruta made.

Solve the problems on the *Adding with Base-Ten Pieces* pages in the *Student Activity Book*.

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Paper-and-Pencil Addition Methods

Sometimes you can solve addition problems in your head. Other times it helps to use paper and pencil. Here are two paper-and-pencil methods you can use. For both methods, you can think of base-ten pieces to help them make sense.

All-Partials Method

Tom looked at the base-ten pieces in Nikia's problem. He added like this:

$$\begin{array}{r} 678 \\ + 267 \\ \hline 800 \\ 130 \\ + 15 \\ \hline 945 \end{array}$$

Nikia showed her work this way:

$$\begin{array}{r} 678 \\ + 267 \\ 15 \\ 130 \\ + 800 \\ \hline 945 \end{array}$$

I see what you did. You wrote down the value of the flats, skinnies, and bits. Then you added them all. I use a method like that, but I do it in a different order. It does not matter—we get the same answer.



2. Look at Tom's and Nikia's methods.
 - A. What number shows the value of the bits?
 - B. What number shows the value of the skinnies?
 - C. What number shows the value of the flats?

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

3. **A.** They traded 12 ones for 1 ten and 2 ones. The 1 means 10.
B. They traded 13 tens for 1 hundred and 3 tens. The 1 means 100.
4. **A.** 695
B. 618
C. 972
D. 1211
E. 2291
F. 7902
G. 9211
H. 9013

5. Nisha started with 13 bits. She traded 10 of them for 1 skinny. The 1 above the 3 shows the new skinny. Then she added the total number of skinnies. She had 10 skinnies. She traded all 10 skinnies for 1 flat. There were no skinnies left so she recorded a 0 in the skinnies column. The new flat was recorded by writing a 1 above the 4. She added all the flats. She had 6 flats in all.

Fern had 13 bits to start with. She traded 10 bits for 1 skinny and recorded 13. She added 3 skinnies and 6 skinnies and got 9 skinnies. She recorded this in a new row as 90, 9 skinnies and 0 bits. She added 4 flats and 1 flat and got 5 flats. In a third row she recorded 500 or 5 flats, 0 skinnies, and 0 bits. Altogether she had 5 flats, 10 skinnies, and 3 bits. She traded the 10 skinnies for 1 flat. No skinnies remained.

3. Tom made 547 Chocos in one day and Eric made 285 chocos. This is how they added using the compact method to find the total:

$$\begin{array}{r} \\ 547 \\ + 285 \\ \hline 832 \end{array}$$

A. Why did they put a little 1 above the 4? What does the 1 mean?
B. Why did they put a little 1 above the 5? What does that 1 mean?

4. Use the All-Partials Method to solve some of the problems and the Compact Method to solve the others.

A. $\begin{array}{r} 457 \\ + 238 \\ \hline \end{array}$ **B.** $\begin{array}{r} 123 \\ + 495 \\ \hline \end{array}$ **C.** $\begin{array}{r} 689 \\ + 283 \\ \hline \end{array}$ **D.** $\begin{array}{r} 722 \\ + 489 \\ \hline \end{array}$

E. $\begin{array}{r} 1485 \\ + 806 \\ \hline \end{array}$ **F.** $\begin{array}{r} 3609 \\ + 4293 \\ \hline \end{array}$ **G.** $\begin{array}{r} 7423 \\ + 1788 \\ \hline \end{array}$ **H.** $\begin{array}{r} 8001 \\ + 1012 \\ \hline \end{array}$

5. Nisha and Fern solved a problem using paper and pencil. Here is their work.

<p>Nisha's solution</p> $\begin{array}{r} \\ 435 \\ + 168 \\ \hline 603 \end{array}$	<p>Fern's solution</p> $\begin{array}{r} 435 \\ + 168 \\ \hline 13 \\ 90 \\ + 500 \\ \hline 603 \end{array}$
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Compare the two pencil-and-paper solutions. Explain what Nisha and Fern did to find their answers.

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✓ **Check-In: Questions 6-11**

6. Solve the following problems using a paper-and-pencil method. Use the *Addition Strategies Menu* in the *Student Guide* Reference section. Check to see if your answer is reasonable.

A.
$$\begin{array}{r} 68 \\ + 39 \\ \hline \end{array}$$

B.
$$\begin{array}{r} 403 \\ + 79 \\ \hline \end{array}$$

C.
$$\begin{array}{r} 247 \\ + 130 \\ \hline \end{array}$$

D.
$$\begin{array}{r} 1235 \\ + 2638 \\ \hline \end{array}$$

E.
$$\begin{array}{r} 5762 \\ + 1829 \\ \hline \end{array}$$

F.
$$\begin{array}{r} 3208 \\ + 5732 \\ \hline \end{array}$$

7. Show how Question 6B can be solved using a mental math strategy.
8. Explain an estimate strategy that shows your answer to Question 6E is reasonable.
9. Choose one problem from Question 6 to solve:
- A. using expanded form.
 - B. using the all-partials method.
 - C. using the compact method.
 - D. Which method do you like best? Why?
10. Eric and Tom made 1432 Chocos on Wednesday, 938 Chocos on Thursday, and 2007 Chocos on Friday. Put these numbers in order from smallest to largest.
11. How many Chocos did they make altogether on Wednesday and Thursday?

Play the *Digits Game* and then complete the *Problem Solving* pages for more addition practice. Both items are in the *Student Activity Book*.

Solution strategies will vary.

6. A. 107
 B. 482
 C. 377
 D. 3873
 E. 7591
 F. 8940

7. Possible strategy:

$$79 + 1 = 80;$$

$$402 + 80 = 482$$

8. Possible response: It is a reasonable answer because if only the thousands and hundreds are added together the answer is 7500.

9. A. Possible strategies for 6F:

$$\begin{array}{r} 3208 = 3000 + 200 + 0 + 8 \\ + 5732 = 5000 + 700 + 30 + 2 \\ \hline = 8000 + 900 + 30 + 10 \\ = 8940 \end{array}$$

B. All-Partials:

$$\begin{array}{r} 3208 \\ + 5732 \\ \hline 10 \\ 30 \\ 900 \\ + 8000 \\ \hline 8940 \end{array}$$

C. Compact:

$$\begin{array}{r} 1 \\ 3208 \\ + 5732 \\ \hline 8940 \end{array}$$

D. Answers will vary.

10. 938, 1432, 2007
 11. 2370 Chocos

Student Guide

Homework (SG p. 145)
Questions 1–7

1.
$$\begin{array}{r} 732 \\ + 197 \\ \hline 929 \end{array}$$

2. A.
$$\begin{array}{r} 379 \\ + 613 \\ \hline 992 \end{array}$$

B.
$$\begin{array}{r} 543 \\ + 182 \\ \hline 725 \end{array}$$

C.
$$\begin{array}{r} 418 \\ + 824 \\ \hline 1242 \end{array}$$

D.
$$\begin{array}{r} 328 \\ + 593 \\ \hline 921 \end{array}$$

3. I used friendly numbers. 328 is close to 300. 593 is close to 600. $300 + 600 = 900$. 921 is a reasonable answer.

4.
$$\begin{array}{r} 11 \\ 654 \\ + 879 \\ \hline 1533 \end{array}$$

5. Maruta traded 13 tens for 1 hundred and 3 tens. The one means 100.

6. A.
$$\begin{array}{r} 1 \\ 84 \\ 28 \\ + 72 \\ \hline 184 \end{array}$$

B.
$$\begin{array}{r} 1 \\ 417 \\ + 329 \\ \hline 746 \end{array}$$

C.
$$\begin{array}{r} 1 \\ 928 \\ + 434 \\ \hline 1362 \end{array}$$

D.
$$\begin{array}{r} 1 \quad 1 \\ 3928 \\ + 4645 \\ \hline 8571 \end{array}$$

E. If I add the hundreds $900 + 400 = 1300$. 1362 is reasonable.

1. Tom was working on the problem below when the fire alarm rang. Finish his problem using the all-partials method.

$$\begin{array}{r} 732 \\ + 197 \\ \hline 800 \\ 120 \\ + \quad \quad \quad \end{array}$$

2. Use Tom's all-partials method to solve these problems. Check to see if your answer is reasonable.

A.
$$\begin{array}{r} 379 \\ + 613 \\ \hline \end{array}$$
 B.
$$\begin{array}{r} 543 \\ + 182 \\ \hline \end{array}$$
 C.
$$\begin{array}{r} 418 \\ + 824 \\ \hline \end{array}$$
 D.
$$\begin{array}{r} 328 \\ + 593 \\ \hline \end{array}$$

3. Explain an estimation strategy that shows your answer to Question 2D is reasonable.

4. Maruta started the problem below. Finish it using the compact method.

$$\begin{array}{r} 1 \\ 654 \\ + 879 \\ \hline 33 \end{array}$$

5. Why did Maruta put a 1 above the 6?

6. Use Maruta's compact method to solve these problems. Check to see if your answer is reasonable.

A.
$$\begin{array}{r} 84 \\ 28 \\ + 72 \\ \hline \end{array}$$
 B.
$$\begin{array}{r} 417 \\ + 329 \\ \hline \end{array}$$
 C.
$$\begin{array}{r} 928 \\ + 434 \\ \hline \end{array}$$
 D.
$$\begin{array}{r} 3928 \\ + 4645 \\ \hline \end{array}$$

E. Explain an estimation strategy that shows your answer to Question 6C is reasonable.

7. Solve these problems. Use the *Addition Strategies Menu* in the Reference section to choose a method.

A.
$$\begin{array}{r} 268 \\ + 359 \\ \hline \end{array}$$
 B.
$$\begin{array}{r} 409 \\ + 312 \\ \hline \end{array}$$
 C.
$$\begin{array}{r} 5617 \\ + 2193 \\ \hline \end{array}$$
 D.
$$\begin{array}{r} 6891 \\ + 2534 \\ \hline \end{array}$$

E. Explain an estimation strategy that shows your answer to Question 7A is reasonable.

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7. Methods will vary.

A.
$$\begin{array}{r} 1 \quad 1 \\ 268 \\ + 359 \\ \hline 627 \end{array}$$

B.
$$\begin{array}{r} 1 \\ 409 \\ + 312 \\ \hline 721 \end{array}$$

C.
$$\begin{array}{r} 5617 \\ + 2193 \\ \hline 10 \\ 100 \\ 700 \\ + 7000 \\ \hline 7810 \end{array}$$

D.
$$\begin{array}{r} 1 \quad 1 \\ 6891 \\ + 2534 \\ \hline 9425 \end{array}$$

E. Possible explanation: I use friendly numbers. 268 is close to 250 and 359 is close to 350. $250 + 350 = 600$. 627 is reasonable.

Student Activity Book

Name _____ Date _____

Adding with Base-Ten Pieces

Nikia and Maruta both work at the TIMS Candy Company. Nikia made 196 Chocos. Maruta made 232 Chocos. They used base-ten pieces to figure out how much candy they made together. They recorded their work with base-ten shorthand and a recording sheet.

1000s	100s	10s	1s
	1	9	6
+	2	3	2
	3	12	8
	4	2	8

1. Another time Nikia made 237 Chocos and Maruta made 155. Find how much they made altogether. Solve the problem using base-ten shorthand and record your work on the recording sheet. Make sure you use the Fewest Pieces Rule.

1000s	100s	10s	1s
+			

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Adding with Base-Ten Pieces (SAB pp. 191–192)

Questions 1–5

1.

1000s	100s	10s	1s
	2	3	7
+	1	5	5
	3	8	12
	3	9	2

2.

1000s	100s	10s	1s
		6	9
+		2	3
		8	12
	1	0	2

3.

1000s	100s	10s	1s
	3	2	4
+	1	9	4
	4	11	8
	5	1	8

4.

1000s	100s	10s	1s
	2	6	0
+		7	4
	2	13	4
	3	3	4

5.

1000s	100s	10s	1s
	1	3	0
+		4	9
	1	7	9
	1	7	9

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Solve the problems using base-ten shorthand. Then record your work on the recording sheet.

2. $69 + 23 + 18$

1000s	100s	10s	1s
+			

3. $324 + 194$

1000s	100s	10s	1s
+			

4. $2607 + 748$

1000s	100s	10s	1s
+			

5. $1308 + 4196$

1000s	100s	10s	1s
+			

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Problem Solving (SAB pp. 195–196)
Questions 1–5

1. Romesh Second Method

$\begin{array}{ c c } \hline 6 & 4 \\ \hline \end{array} = 60 + 4$ $+ \begin{array}{ c c } \hline 8 & 7 \\ \hline \end{array} = 80 + 7$ <hr style="width: 80%; margin: 0 auto;"/> $140 + 11 = 151$	$\begin{array}{r} 1 \\ 64 \\ + 87 \\ \hline 151 \end{array}$
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Jason

$\begin{array}{ c c } \hline 7 & 4 \\ \hline \end{array} = 70 + 4$ $+ \begin{array}{ c c } \hline 8 & 6 \\ \hline \end{array} = 80 + 6$ <hr style="width: 80%; margin: 0 auto;"/> $150 + 10 = 160$	$\begin{array}{r} 74 \\ + 86 \\ \hline 150 \\ + 10 \\ \hline 160 \end{array}$
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2. Kathy Estimation Strategy

$\begin{array}{ c c c } \hline 8 & 1 & 4 \\ \hline \end{array}$ $+ \begin{array}{ c c c } \hline 6 & 2 & 3 \\ \hline \end{array}$ <hr style="width: 80%; margin: 0 auto;"/> $1 \quad 4 \quad 3 \quad 7$	$\begin{array}{r} 800 \\ + 600 \\ \hline 1400 \end{array}$ <p>1437 is a reasonable answer.</p>
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Sara

$\begin{array}{ c c c } \hline 1 & 6 & 3 \\ \hline \end{array}$ $+ \begin{array}{ c c c } \hline 8 & 4 & 2 \\ \hline \end{array}$ <hr style="width: 80%; margin: 0 auto;"/> $1 \quad 0 \quad 0 \quad 5$	$\begin{array}{r} 200 \\ + 800 \\ \hline 1000 \end{array}$ <p>1005 is a reasonable answer.</p>
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3. Kathy won. Kathy had the two largest numbers in the hundreds place. $800 + 600 = 1400$.

4.* See discussion in the lesson.

5. A. If I add the hundreds ($900 + 700$) and the tens ($60 + 50$) I get $1600 + 110 = 1710$. His answer of 1616 is not reasonable.

B. $961 + 754$ does not equal 1616. He added 11 ones instead of 11 tens.

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

Name _____ Date _____

Problem Solving

Solve the problems. Use the *Addition Strategies Menu* in the *Student Guide Reference* section.

1. Romesh and Jason are playing the Digits Game. After four cards, their boards are below. Find each boy's sum using two different methods.

<p>Romesh</p> $\begin{array}{ c c } \hline 6 & 4 \\ \hline \end{array}$ $+ \begin{array}{ c c } \hline 8 & 7 \\ \hline \end{array}$	<p>Second Method</p>
<p>Jason</p> $\begin{array}{ c c } \hline 7 & 4 \\ \hline \end{array}$ $+ \begin{array}{ c c } \hline 8 & 6 \\ \hline \end{array}$	

2. Kathy and Sara played a game for the largest number. Their boards are below. Find each sum. Explain a strategy for deciding if your answers are reasonable.

<p>Kathy</p> $\begin{array}{ c c c } \hline 8 & 1 & 4 \\ \hline \end{array}$ $+ \begin{array}{ c c c } \hline 6 & 2 & 3 \\ \hline \end{array}$	<p>Estimation Strategy</p>
<p>Sara</p> $\begin{array}{ c c c } \hline 1 & 6 & 3 \\ \hline \end{array}$ $+ \begin{array}{ c c c } \hline 8 & 4 & 2 \\ \hline \end{array}$	

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3. Who won Kathy and Sara's game? Show how you decided who had the largest number.

4. Miguel's game board looks like the one below. He is trying to find the largest sum. The next card is a 5. Where should he put the 5? Explain your thinking.

$\begin{array}{ c c c } \hline & 6 & 1 \\ \hline \end{array}$ $+ \begin{array}{ c c c } \hline 7 & & 4 \\ \hline \end{array}$	
---	--

✓ **Check-In: Question 5**

5. Miguel's completed game board is to the right. He used the all-partials method to find the sum.

	$\begin{array}{ c c c } \hline 9 & 6 & 1 \\ \hline \end{array}$ $+ \begin{array}{ c c c } \hline 7 & 5 & 4 \\ \hline \end{array}$ <hr style="width: 80%; margin: 0 auto;"/> $\begin{array}{r} 1 \quad 6 \quad 0 \quad 0 \\ 1 \quad 1 \\ \hline 1 \quad 6 \quad 1 \quad 6 \end{array}$
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A. Explain an estimation strategy for checking if his answer is reasonable.

B. Check Miguel's calculations. Do you agree with his solution? Why or why not?

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Name _____ Date _____

Adding the Parts

Homework

Solve the problems using any method. Use the *Addition Strategies Menu* in the Reference section of the *Student Guide*. Check to see if your answer is reasonable.

Johnny solved this problem using the All-Partials Method:

$$\begin{array}{r} 574 \\ + 859 \\ \hline 1300 \\ 120 \\ + 13 \\ \hline 1433 \end{array}$$

Suzanne solved it using Expanded Form:

$$\begin{array}{l} 574 = 500 + 70 + 4 \\ + 859 = 800 + 50 + 9 \\ \hline 1300 + 120 + 13 = 1433 \end{array}$$

A. $\begin{array}{r} 148 \\ + 754 \\ \hline \end{array}$ B. $\begin{array}{r} 652 \\ + 283 \\ \hline \end{array}$

C. $\begin{array}{r} 143 \\ + 629 \\ \hline \end{array}$ D. $\begin{array}{r} 162 \\ + 575 \\ \hline \end{array}$

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E. $\begin{array}{r} 153 \\ + 479 \\ \hline \end{array}$ F. $\begin{array}{r} 342 \\ + 568 \\ \hline \end{array}$

G. $\begin{array}{r} 159 \\ + 456 \\ \hline \end{array}$ H. $\begin{array}{r} 678 \\ + 543 \\ \hline \end{array}$

I. Show how Question A can be solved using a mental math strategy.

J. Explain an estimation strategy that shows your answer to Question H is reasonable.

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Student Activity Book

**Adding the Parts (SAB pp. 197–198)
Homework
Questions A–J**

Explanations will vary.

A. $\begin{array}{r} 148 \\ + 754 \\ \hline 12 \\ 90 \\ + 800 \\ \hline 902 \end{array}$

B. $\begin{array}{l} 652 = 600 + 50 + 2 \\ + 283 = 200 + 80 + 3 \\ \hline 800 + 130 + 5 = 935 \end{array}$

C. $\begin{array}{r} 1 \\ 143 \\ + 629 \\ \hline 772 \end{array}$

D. $\begin{array}{r} 1 \\ 162 \\ + 575 \\ \hline 737 \end{array}$

E. $\begin{array}{r} 11 \\ 153 \\ + 479 \\ \hline 632 \end{array}$

F. $\begin{array}{r} 342 \\ + 568 \\ \hline 10 \\ 100 \\ + 800 \\ \hline 910 \end{array}$

G. $\begin{array}{l} 159 = 100 + 50 + 9 \\ + 456 = 400 + 50 + 6 \\ \hline 500 + 100 + 15 = 615 \end{array}$

H. $\begin{array}{r} 11 \\ 678 \\ + 543 \\ \hline 1221 \end{array}$

I. Explanations will vary. Think of $150 + 750 = 900$. $900 + 2 = 902$

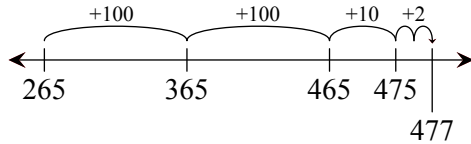
J. Explanations will vary. 678 is close to 700. 543 is close to 500. $700 + 500$ is 1200, so 1221 is reasonable.

Teacher Guide

**Addition Quiz (TG p. 1)
Questions 1–5**



$$400 + 70 + 7 = 477$$



- Fern added the tens. There are 4 tens in 340 and 6 tens in 169. $40 + 60$ is 100.
- Strategies will vary.

A.

$33 = 30 + 3$	Check: 30
$59 = 50 + 9$	60
$+ 29 = 20 + 9$	$+ 30$
$100 + 21 = 121$	120

The sum is about 120.

B.

536	Check: 500
$+ 635$	$+ 600$
1100	1100
60	
$+ 11$	
1171	

Answer is more than 1100.

- See response to Question 3A.
- See response to Question 3B.

Name _____ Date _____

Addition Quiz

Use the *Addition Strategies Menu* in the *Student Guide Reference* section.

- Solve $265 + 212$ using base-ten shorthand or a number line.



- Fern used the all-partials method to solve the following problem. Explain the step shown by the arrow.

342	
$+ 169$	
400	
100	←
$+ 11$	
511	

- Solve the following problems using any method you choose. Check to see if your answers are reasonable.

A.	33	B.	536
	59		$+ 635$
	$+ 29$		

- Show how Question 3A can be solved using a mental math strategy.
- Explain an estimation strategy that shows your answer to Question 3B is reasonable.

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