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### Use Addition and Subtraction Strategies

A Closer Look at the Digits Game

✓ **Self-Check: Questions 1-4**

1. Romesh and Jacob are playing the digits game. They need to find the largest sum. Seven numbers were placed on each board.

A. Use an estimation strategy to decide who found the largest sum. Show your strategy.

Romesh

7	8	4	1
+	6	5	3

Estimation Strategy

Jacob

7	4	5	3
+	6	8	1

Estimation Strategy

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is about  $900,000,000 - 500,000,000 = 400,000,000$ , so they are about the same. If you round each number to the nearest ten thousand the distance between Earth and Jupiter is  $480,000,000 - 90,000,000 = 390,000,000$  and the distance between Jupiter and Saturn is  $890,000,000 - 480,000,000 = 410,000,000$ . These two distances are still close as both are about  $400,000,000$ .

## Student Activity Book

### Use Addition and Subtraction Strategies (SAB. pp. 151–158) Questions 1–13

1. A. Possible response: I used convenient numbers  $7840 + 650 = 8490$  for Romesh and  $7450 + 680 = 8130$  for Jacob. Romesh found the largest sum.
- B. Possible strategy for Romesh:

$$\begin{array}{r} 7841 \\ + 653 \\ \hline 8494 \end{array}$$

Possible strategy for Jacob:

$$\begin{array}{r} 7453 \\ + 681 \\ \hline 7000 \\ 1000 \\ 130 \\ \hline 4 \\ \hline 8134 \end{array}$$

2. I used mental math. I added 2 to 1498 to make it 1500 and then I added 1000 to get to 2500 and then another 3 to get to 2503.  $2 + 1000 + 3 = 1005$ . This is reasonable because  $2500 - 1500$  is 1000 and that is very close to 1005.
3. A. Possible response: I do not agree with Jessie because she added the ones and tens and then subtracted the 100s. The answer will be 179.
- B. Since Grace could not subtract 5 from 3 she regrouped by taking the ten to make 13 ones then she subtracted  $13 - 5 = 8$ . Then Grace could not subtract 8 tens from 0 tens so she regrouped taking 10 ten or 100 from the 600 leaving 500. That left  $10 - 8$  in the tens column and  $5 - 4$  in the hundreds column.
- C. Jessie found the largest difference.

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B. Find the solution for each boy's game board. Use a different strategy for each problem.

Problem	My Strategy								
<p>Romesh</p> <table border="1" style="border-collapse: collapse; text-align: center; width: 100%;"> <tr><td>7</td><td>8</td><td>4</td><td>1</td></tr> <tr><td>+</td><td>6</td><td>5</td><td>3</td></tr> </table>	7	8	4	1	+	6	5	3	
7	8	4	1						
+	6	5	3						
<p>Jacob</p> <table border="1" style="border-collapse: collapse; text-align: center; width: 100%;"> <tr><td>7</td><td>4</td><td>5</td><td>3</td></tr> <tr><td>+</td><td>6</td><td>8</td><td>1</td></tr> </table>	7	4	5	3	+	6	8	1	
7	4	5	3						
+	6	8	1						

2. Shannon is playing for the smallest difference. Here is her game board. Find the difference. Then use estimation to decide if your answer is reasonable. Explain your estimation strategy.

2	5	0	3
-	1	4	9

Estimation Strategy

3. Jessie and Grace played a game for the largest difference.

A. Look at Jessie's game board. Do you agree with Jessie's solution? Why or why not?

Jessie's Board

8	1	4
-	6	3
2 4 9		

Estimation Strategy

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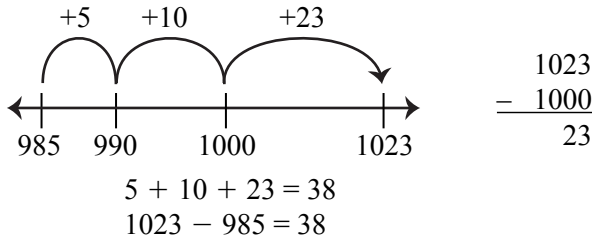
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4. 1116; 38, Maya won.

$$\begin{array}{r} 4 \ 10 \\ 1\cancel{3}08 \\ - 392 \\ \hline 1116 \end{array} \qquad \begin{array}{r} 1500 \\ - 400 \\ \hline 1100 \end{array}$$



5. A. John added  $70 + 50 = 120$ .

B. Possible solution:

$$\begin{array}{r} 853 \\ + 742 \\ \hline 1500 \\ 90 \\ + 5 \\ \hline 1595 \end{array}$$

6. A.

$$\begin{array}{r} 472 \\ + 358 \\ \hline \end{array}$$

B. Possible solution:

$$\begin{array}{r} 853 \\ + 742 \\ \hline 1500 \\ 90 \\ + 5 \\ \hline 1595 \end{array}$$

C. Possible solution:

$$\begin{array}{r} 11 \\ 248 \\ + 357 \\ \hline 605 \end{array}$$

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B. Look at Grace's game board. Explain how Grace found her solution.

Grace's Board

5	10	13
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	8	5
1	2	8

C. Who found the largest difference, Jessie or Grace?

4. Jerome and Maya played a game for the smallest difference. Finish the solutions started by Jerome and Maya. Then use an estimation strategy to decide if your answers are reasonable. Circle the winner.

Jerome

1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8
3	9	2	6

Estimation Strategy

Maya

1	0	2	3
9	8	5	5

Estimation Strategy

$1023 - 985 =$

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Use Self-Check: Questions 1–4 and the Workshop Menu: A Closer Look at the Digits Game to choose practice for using strategies in addition and subtraction.

**Workshop Menu: A Closer Look at the Digits Game**

Can I Do This?	Working On It! <small>I could use some extra help.</small>	Getting It! <small>I just need some more practice.</small>	Got It! <small>I'm ready for a challenge.</small>
Use place value concepts to make trades in addition and subtraction.	*Q# 5, 7B, 13A	● Q# 5, 7B, 13A	■ Q# 6A, 8, 13A
Use more than one strategy to add and subtract multidigit numbers.	*Q# 9–10, 13B	● Q# 11, 13B	■ Q# 6B–C, 13B
Estimate sums and differences.	*Q# 7A, 10	● Q# 7A, 12	■ Q# 12

★5. John was playing for the largest sum. Look at his game board and solution.

4	7	2
+	3	5
7	0	0
1	2	0
+	1	0
8	3	0

A. Explain how John got 120 in his solution.

B. Using the same digits John used, arrange the digits to find a larger sum. Use John's strategy to find the sum.

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6. ■A. John was playing for the largest sum. Some of the digits are missing from his solution. Find the missing digits.

$$\begin{array}{r} 4 \square \square 2 \\ + \square \square 5 \square \\ \hline 7 \ 0 \ 0 \\ 1 \ 2 \ 0 \\ + \square \ 1 \ 0 \\ \hline 8 \ 3 \ 0 \end{array}$$

■B. Use John's six digits to make a problem with the largest possible sum. Use any strategy to solve the problem.

■C. Use John's six digits to make a problem with the smallest possible sum. Use any strategy to solve the problem.

7. Ana is playing for the smallest difference. Look at her game board and solution.

$$\begin{array}{r} 7 \ 1 \ 3 \\ - \square \ 8 \ 9 \\ \hline 7 \ 9 \ 6 \end{array}$$

★A. Use estimation to decide if Ana's solution is reasonable. Explain your thinking.

★B. Show or tell Ana how to find the correct solution for her game board.

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8. Luis is playing for the smallest difference. He left some numbers out on his game board and solution. Find the missing numbers. Explain your thinking.

$$\begin{array}{r} 2 \square \square 4 \\ - \square \ 3 \ 9 \ 8 \\ \hline 6 \ 5 \ 6 \end{array}$$

9. Sam placed 6 digits on his game board. Explain how Sam can use a mental math strategy to find the solution.

$$\begin{array}{r} 5 \ 0 \ 2 \\ + \square \ 4 \ 9 \\ \hline \end{array}$$

10. Nisha and Roberto are playing a game for the largest sum. Finish the solution strategies started by Nisha and Roberto. Estimate to show the solutions are reasonable. Circle the winner.

Nisha's Board	Nisha's Strategy	Estimation
$\begin{array}{r} 4 \ 6 \ 3 \ 0 \\ + 8 \ 5 \ 9 \ 1 \\ \hline \end{array}$	$\begin{array}{r} 4630 \\ + 8591 \\ \hline 12000 \\ + 120 \\ \hline \end{array}$	
Roberto's Board	Roberto's Strategy	Estimation
$\begin{array}{r} 9 \ 3 \ 4 \ 1 \\ + 5 \ 8 \ 6 \ 0 \\ \hline \end{array}$	$\begin{array}{r} 9341 \\ + 5860 \\ \hline \end{array}$	

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7. A. Ana's solution is not reasonable. Her answer is bigger than the biggest number in the subtraction problem. The answer will be closer to 600.
- B. Possible response: Ana could use mental math. She could first do  $700 - 90 = 610$ . Since the number was really 89 she would need to add 1 from 610 to make it 611 and then add the 13 she took away from 713 so,  $611 + 13 = 624$ .
8. 
$$\begin{array}{r} 2054 \\ - 1398 \\ \hline 656 \end{array}$$
- Possible response: I thought about addition:
- $$\begin{array}{r} 1 \ 1 \ 1 \\ \square 398 \\ + 656 \\ \hline 2054 \end{array}$$
- Since the digit in the thousands place had to equal 2, I knew the digit in the thousands place in the lower number would be a 1.
9. Sam can think about  $500 + 350 = 850$ . Then since he took 2 away from the top number and added one to the bottom number he will have to add 1 to his answer: 851.

**10. Nisha's Boards**

$$\begin{array}{r} 4630 \\ + 8591 \\ \hline 12000 \\ 1100 \\ 120 \\ \hline 1 \\ \hline 13,221 \end{array}$$

A possible estimation strategy:  
 $4600 + 8600 = 13200$ .

**Roberto's Board**

$$\begin{array}{r} 1 \ 1 \\ 9341 \\ + 5860 \\ \hline 15,201 \end{array}$$

A possible estimation strategy  
 $9000 + 6000 = 15,000$

11. Possible strategies:

$$\begin{array}{r} 2643 \\ + 958 \\ \hline 2000 \\ 1500 \\ 90 \\ \hline 11 \\ \hline 3601 \end{array}$$

12. A. Rosa will win.

B. Possible response: Rosa's top number is close to 2500 and her bottom number is close to 600.  $2500 - 600 = 1900$ . Suzanne's top number is close to 2700 and her bottom number is close to 700.  $2700 - 700 = 2000$ . Rosa's difference is smaller than Suzanne's.

13. A.\* I think Jackie will win because she can make a bigger number on the top and her number on the bottom will be smaller than Tanya's so her difference will be larger.

B.\*

$$\begin{array}{r} 432 \\ - 51 \\ \hline 381 \end{array}$$

$$\begin{array}{r} 300 \quad 130 \\ \del{400} + \del{30} + 2 \\ \hline 50 + 1 \\ \hline 300 + 80 + 1 = 381 \end{array}$$

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•11. Emily placed 7 digits on her game board. Find the solution for Emily's game board using two different strategies.

Game Board	One Strategy	Another Strategy
$\begin{array}{r} 2643 \\ + 958 \\ \hline \end{array}$		

•12. Rosa and Suzanne are playing for the smallest difference.

A. Use estimation to decide who will win this round. Circle the winner.

Rosa's Board: 
$$\begin{array}{r} 2493 \\ - 617 \\ \hline \end{array}$$

Suzanne's Board: 
$$\begin{array}{r} 2694 \\ - 731 \\ \hline \end{array}$$

B. Explain your reasoning.

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✓ Check-In: Question 13

•13. Tanya and Jackie are playing a version of the Digits Game. They are making subtraction problems using cards numbered 1 to 5. The player whose subtraction problem gives the largest difference wins the game. Look at where each girl placed the first two of her cards.

Tanya: 
$$\begin{array}{r} \square 1 \square \\ - 5 \square \\ \hline \end{array}$$

Jackie: 
$$\begin{array}{r} \square \square \square \\ - 51 \\ \hline \end{array}$$



A. Without placing the missing numbers decide who will win the game. Explain how you know this person will win.

B. Look at Tanya's and Jackie's boards. Write the subtraction problem that will win the game. Show how to solve it in two different ways.

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