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Use Expanded Form to Add

First estimate the sum. Then show each problem using base-ten pieces. Write it in base-ten shorthand and expanded form. Solve it. Remember the Fewest Pieces Rule when writing your final answer. You may draw a picture of your trades. Draw a circle around your final answer.

Example:

$\begin{array}{r} 66 \\ + 17 \\ \hline \end{array}$		$66 = 60 + 6$	$+ 17 = 10 + 7$	$70 + 13 = 83$
Estimate: $70 + 20 = 90$				

1.
$$\begin{array}{r} 28 \\ + 19 \\ \hline \end{array}$$

Estimate:

2. $53 + 27 =$

Estimate:

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3.
$$\begin{array}{r} 39 \\ + 44 \\ \hline \end{array}$$

Estimate:

4. $93 + 21 =$

Estimate:

5.
$$\begin{array}{r} 58 \\ + 73 \\ \hline \end{array}$$

Estimate:

6. Look at Question 1 again. How could you solve it using mental math or another strategy or tool?

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

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Use Expanded Form to Add (SAB pp. 341–342)
Questions 1–6

Possible responses are given for estimates.

1.
$$\begin{array}{r} 28 = 20 + 8 \\ + 19 = 10 + 9 \\ \hline 30 + 17 = 47 \end{array}$$

Estimate: $30 + 20 = 50$

2.
$$\begin{array}{r} 53 = 50 + 3 \\ + 27 = 20 + 7 \\ \hline 70 + 10 = 80 \end{array}$$

Estimate: $50 + 30 = 80$

3.
$$\begin{array}{r} 39 = 30 + 9 \\ + 44 = 40 + 4 \\ \hline 70 + 13 = 83 \end{array}$$

Estimate: $40 + 40 = 80$

4.
$$\begin{array}{r} 93 = 90 + 3 \\ + 21 = 20 + 1 \\ \hline 110 + 4 = 114 \end{array}$$

Estimate: $90 + 20 = 110$

5.
$$\begin{array}{r} 58 = 50 + 8 \\ + 73 = 70 + 3 \\ \hline 120 + 11 = 131 \end{array}$$

Estimate: $60 + 70 = 130$

6.* Answers will vary. Possible response:
If I used mental math I could estimate
 $30 + 20 = 50$ then subtract 3 to get 47.

**Two Ways to Write and Solve a Problem
(SAB pp. 343–344)**

Questions 1–4

Possible responses are given for estimates.

1. $31 = 30 + 1$ 31
 $55 = 50 + 5$ $+ 55$
 $80 + 6 = 86$ 80
 $+ 6$
 86

Estimate: $30 + 50 = 80$

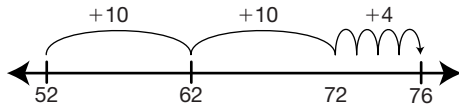
2. $37 = 30 + 7$ 37
 $43 = 40 + 3$ $+ 43$
 $70 + 10 = 80$ 10
 $+ 70$
 80

Estimate: $40 + 40 = 80$

3. $52 = 50 + 2$ 52
 $24 = 20 + 4$ $+ 24$
 $70 + 6 = 76$ 70
 $+ 6$
 76

Estimate: $50 + 25 = 75$

4. Answers will vary. Possible response for $52 + 24$:



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Two Ways to Write and Solve a Problem

Solve each problem using two different paper-and-pencil methods. Remember to estimate first. Draw a circle around your answers.

Example:	Expanded Form	All-Partials
$23 + 46$	$23 = 20 + 3$ $+ 46 = 40 + 6$ $60 + 9 = 69$	23 $+ 46$ 60 $+ 9$ 69
Estimate: $25 + 50 = 75$		

1. $31 + 55$

Estimate: <input style="width: 100%;" type="text"/>	
Expanded Form	All-Partials

2. $37 + 43 =$

Estimate: <input style="width: 100%;" type="text"/>	
Expanded Form	All-Partials

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	Expanded Form	All-Partials
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3. $52 + 24$

Estimate: <input style="width: 100%;" type="text"/>	
---	--

4. Choose one problem from Questions 1–3. Solve it using a mental math strategy. Show or tell how you solved it. Use tools like a 200 Chart, number line, or coins.

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Three Students' Work

1. Mario used expanded form to solve this problem, but he did not finish. Finish his problem.

$$\begin{array}{r} 63 = 60 + 3 \\ + 21 \\ \hline \end{array}$$

2. Emily used all-partials to solve this problem.

$$\begin{array}{r} 47 \\ + 35 \\ 70 \\ + 12 \\ 82 \end{array}$$

A. Why did Emily write 12?

B. Why did she write 70?

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3. Kim estimated a sum of about 90 for this problem. Then she used all-partials to solve the problem.

$$\begin{array}{r} 52 \\ + 43 \\ 50 \\ + 90 \\ 140 \end{array}$$

140?
That is not
reasonable!



A. Solve $52 + 43$ using all-partials.

B. What would you tell Kim to help her?

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**Three Students' Work (SAB pp. 345–346)
Questions 1–3**

1. $63 = 60 + 3$
 $+ 21 = 20 + 1$
 $80 + 4 = 84$

2. A. 7 ones plus 5 ones equals 12.
 B. 4 tens plus 3 tens equals 70.

3. A. 52
 $+ 43$
 5
 $+ 90$
 95

- B. Possible response: Kim should have added 2 ones plus 3 ones. Instead, she added 2 tens plus 3 tens and wrote down 50. Then she added 5 tens and 4 tens and added 90 to the 50 to get 140.

Teacher Guide

Paper-and-Pencil Addition (TG pp. 1–2)

Homework

Questions 1–5

1. $72 = 70 + 2$ 72
 $16 = 10 + 6$ $+ 16$
 $80 + 8 = \textcircled{88}$ 80
 $+ 8$
 $\textcircled{88}$

2. $27 = 20 + 7$ 27
 $34 = 30 + 4$ $+ 34$
 $50 + 11 = \textcircled{61}$ 11
 $+ 50$
 $\textcircled{61}$

3. $45 = 40 + 5$ 45
 $59 = 50 + 9$ $+ 59$
 $90 + 14 = \textcircled{104}$ 90
 $+ 14$
 $\textcircled{104}$


4. $68 = 60 + 8$ 68
 $37 = 30 + 7$ $+ 37$
 $90 + 15 = \textcircled{105}$ 90
 $+ 15$
 $\textcircled{105}$

5. $73 = 70 + 3$ 73
 $85 = 80 + 5$ $+ 85$
 $150 + 8 = \textcircled{158}$ 150
 $+ 8$
 $\textcircled{158}$

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Paper-and-Pencil Addition



Dear Family Member:

Your child has been learning some different ways to solve addition problems using pencil and paper. We are reinforcing your child's growing understanding of the place value system. The two ways featured in this homework assignment are what we have called the expanded form method and the all-partials method. Examples of both are below.

Have your child explain them to you as he or she works these problems. You may have learned other ways to add, like the traditional algorithm. These methods will help your child develop conceptual understanding, flexibility, and fluency with multidigit addition.

Thank you.

Solve each problem using both ways. Look at the examples.

Example:	Expanded Form	All-Partials
61 $+ 28$	$61 = 60 + 1$ $+ 28 = 20 + 8$ $80 + 9 = \textcircled{89}$	61 $+ 28$ 80 $+ 9$ $\textcircled{89}$
Expanded Form		All-Partials
1. 72 $+ 16$		

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	Expanded Form	All-Partials
2. 27 $+ 34$		
Expanded Form		All-Partials
3. 45 $+ 59$		
Expanded Form		All-Partials
4. 68 $+ 37$		
Expanded Form		All-Partials
5. 73 $+ 85$		

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