

Add Whole Numbers



Dear Family,

This week your child is learning to add whole numbers using the standard algorithm.

One way your child is adding is by using place value in an addition problem such as $6,859 + 2,703$.

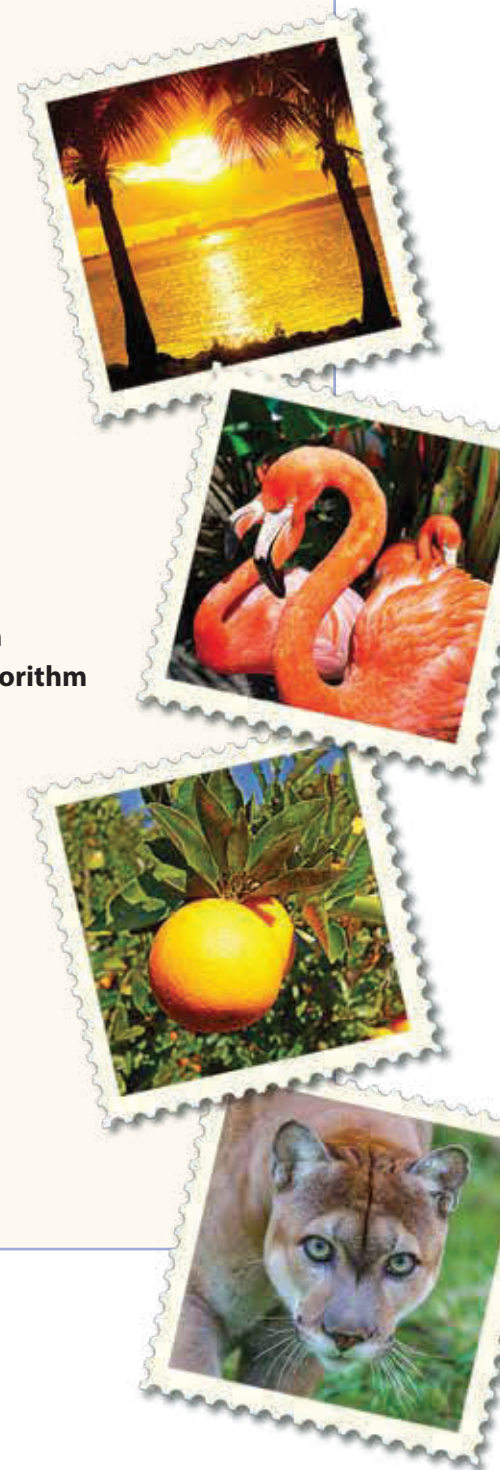
In this problem, you can use place value to add. Add ones to ones, tens to tens, hundreds to hundreds, and thousands to thousands.

$$\begin{array}{r} 6,859 \\ + 2,703 \\ \hline 12 \\ 50 \\ 1,500 \\ 8,000 \\ \hline 9,562 \end{array}$$

Your child is also learning to use the standard algorithm for addition to add and to show **regrouping** above an addition problem. An **algorithm** is a set of steps used to solve a problem.

$$\begin{array}{r} \\ 6,859 \\ + 2,703 \\ \hline 9,562 \end{array}$$

Invite your child to share what he or she knows about adding whole numbers by doing the following activity together.



ACTIVITY ADD WHOLE NUMBERS

Do this activity with your child to add whole numbers.

- Ask your child to come up with a four-digit number that is less than 5,000. This will be the “special” number.

Example: Your child picks 3,854.

- Have your child ask a family member for a four-digit number less than 5,000.

Example: The family member picks 2,093.

- Have your child add the two numbers.

Example:

$$\begin{array}{r} 3,854 \\ + 2,093 \\ \hline 5,947 \end{array}$$

- Then have your child round each number to the nearest thousand to check that his or her sum is reasonable.

Example: 3,854 rounds to 4,000.

2,093 rounds to 2,000.

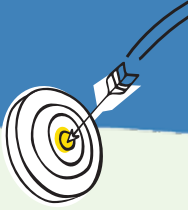
$$4,000 + 2,000 = 6,000$$

Because 6,000 is close to 5,947, your child’s sum is reasonable.

- Repeat the activity. Use the “special” number and have a family member choose another four-digit number that is less than 5,000.
- Look for real-life opportunities to add numbers with your child.



Explore Adding Whole Numbers



Learning Target

- Fluently add and subtract multi-digit whole numbers using the standard algorithm.

SMP 1, 2, 3, 4, 5, 6, 7, 8

In this lesson, you will use place-value understanding, basic facts, and an algorithm to add numbers. Use what you know to try to solve the problem below.

Katie has 3,437 stamps in her collection, and Steve has 942 stamps in his collection. How many stamps do Katie and Steve have in all?



TRY IT



Math Toolkit

- base-ten blocks
- hundred thousands place-value charts
- grid paper
- number lines



DISCUSS IT

Ask your partner: Can you explain that again?

Tell your partner: A model I used was . . . It helped me . . .

CONNECT IT

1 LOOK BACK

Explain how you can find the number of stamps Katie and Steve have in all.

2 LOOK AHEAD

There are many ways to add numbers. For example, you can use drawings or base-ten blocks. You can also break apart numbers to add, add numbers by place value, or use an algorithm. An algorithm is a set of steps used to solve a problem. When you line up numbers by place value, you use an algorithm.

Suppose you want to add greater numbers such as 35,705 and 23,241.

a. Without adding, circle the strategy that might be best for adding.

Draw a Picture

Line Up by Place Value

$$\begin{array}{r} 35,705 \\ + 23,241 \\ \hline \end{array}$$

b. Explain your choice.

3 REFLECT

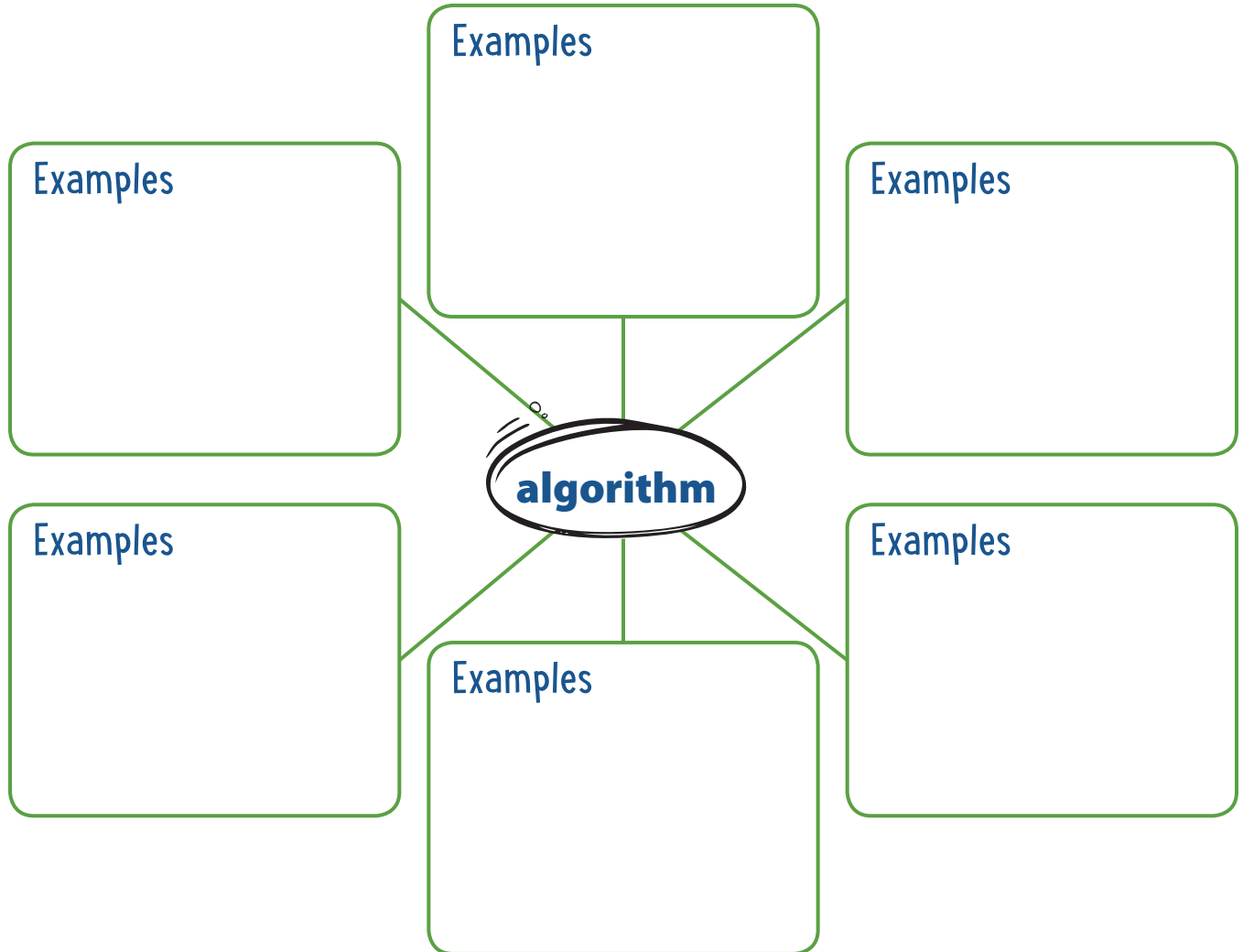
Look at problem 2 above. Would the sum be the same whether you drew a picture, lined up by place value to add, or used another strategy? Explain.

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Prepare for Adding Whole Numbers

- 1 Think about what you know about algorithms. Fill in each box. Use words, numbers, and pictures. Show as many ideas as you can.



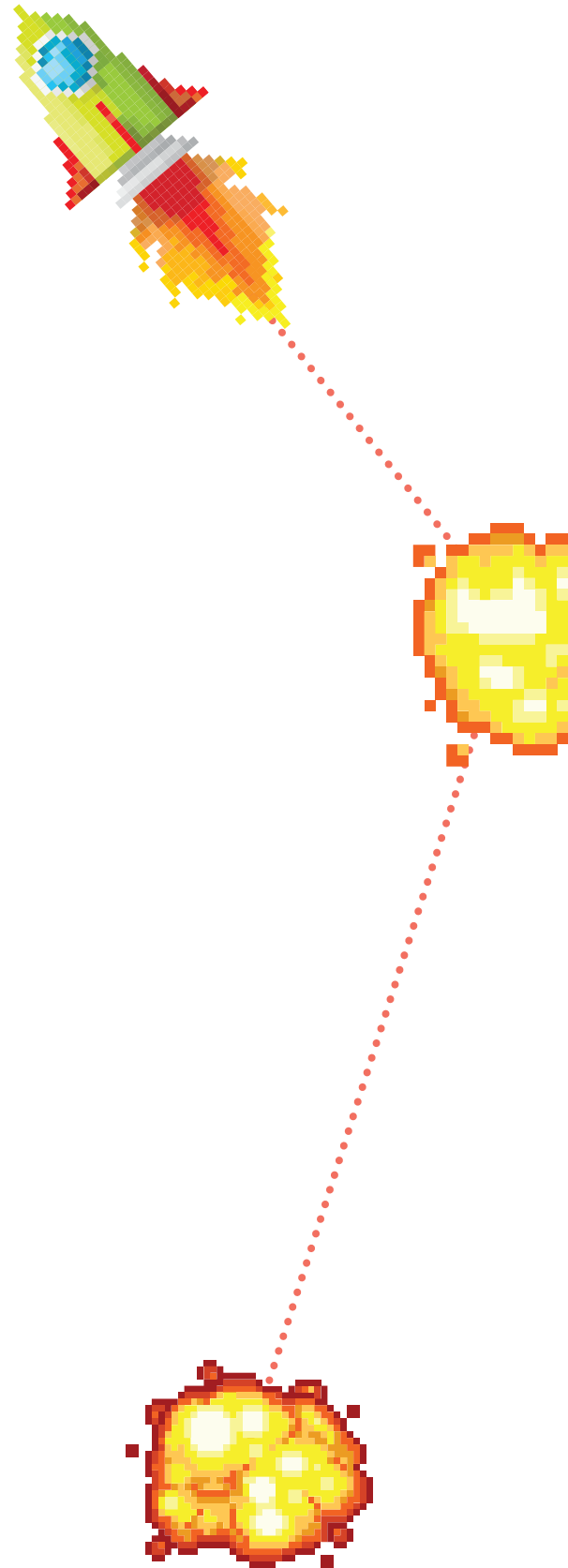
- 2 Describe the steps of an algorithm you can use to add 4,562 and 3,679.

- 3 Solve the problem. Show your work.

Alfonso earns 1,075 points in a video game, and Ana earns 892 points in the same video game. How many points do Alfonso and Ana earn in all?

Solution

- 4 Check your answer. Show your work.



Develop Using Strategies to Add


Read and try to solve the problem below.

At a fair, 4,657 ride tickets are sold on Saturday and 3,804 tickets are sold on Sunday. How many tickets are sold in all during those two days? Use any strategy to add.

TRY IT



Math Toolkit

- base-ten blocks 
- hundred thousands place-value charts
- grid paper

DISCUSS IT

Ask your partner: Why did you choose that strategy?

Tell your partner: The strategy I used to find the answer was . . .

Explore different ways to understand adding four-digit numbers.

At a fair, 4,657 ride tickets are sold on Saturday and 3,804 tickets are sold on Sunday. How many tickets are sold in all during those two days? Use any strategy to add.

MODEL IT

You can use place value to add. Add ones to ones, tens to tens, hundreds to hundreds, and then thousands to thousands.

$$\begin{array}{r}
 4,657 \\
 + 3,804 \\
 \hline
 \end{array}$$

$11 \rightarrow 7 \text{ ones} + 4 \text{ ones} = 11 \text{ ones, or } 1 \text{ ten} + 1 \text{ one}$
 $50 \rightarrow 5 \text{ tens} + 0 \text{ tens} = 5 \text{ tens}$
 $1,400 \rightarrow 6 \text{ hundreds} + 8 \text{ hundreds} = 14 \text{ hundreds, or } 1 \text{ thousand} + 4 \text{ hundreds}$
 $+ 7,000 \rightarrow 4 \text{ thousands} + 3 \text{ thousands} = 7 \text{ thousands}$

$$\begin{array}{r}
 8,461
 \end{array}$$

MODEL IT

You can record the sums by showing regrouping above the problem.

You **regroup** when the sum of the digits in a place is 10 or greater.

$$\begin{array}{r}
 \overset{1}{4,657} \\
 + 3,804 \\
 \hline
 \end{array}$$

$1 \rightarrow 7 \text{ ones} + 4 \text{ ones} = 11 \text{ ones, or } 1 \text{ ten} + 1 \text{ one}$

$$\begin{array}{r}
 \overset{1}{4,657} \\
 + 3,804 \\
 \hline
 \end{array}$$

$61 \rightarrow 1 \text{ ten} + 5 \text{ tens} + 0 \text{ tens} = 6 \text{ tens}$

$$\begin{array}{r}
 \overset{1}{4,657} \\
 + 3,804 \\
 \hline
 \end{array}$$

$461 \rightarrow 6 \text{ hundreds} + 8 \text{ hundreds} = 14 \text{ hundreds, or } 1 \text{ thousand} + 4 \text{ hundreds}$

$$\begin{array}{r}
 \overset{1}{4,657} \\
 + 3,804 \\
 \hline
 \end{array}$$

$8,461 \rightarrow 1 \text{ thousand} + 4 \text{ thousands} + 3 \text{ thousands} = 8 \text{ thousands}$

CONNECT IT

Now you will use the problem from the previous page to help you understand how to add four-digit numbers.

- 1 Here is the second **Model It** showing all the steps at once using the addition algorithm.

$$\begin{array}{r} \\ 4,657 \\ + 3,804 \\ \hline 8,461 \end{array}$$

The sum of the ones is 11. Where do you see 11 in the addition above?

- 2 The sum of the hundreds is 1,400. Where do you see 1,400?
- 3 Why is there a 1 above the tens place and above the thousands place?
- 4 Explain how to add two four-digit numbers if you need to regroup ones and hundreds.

5 REFLECT

Look back at your **Try It**, strategies by classmates, **Model Its**, and **Connect It** problem 1. Which models or strategies do you like best for adding four-digit numbers? Explain.

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APPLY IT

Use what you just learned to solve these problems.

- 6 A video game company sells 5,680 copies of its new game on the first day and 3,235 copies on the second day. In those two days, how many copies of the game does the company sell? Show your work.

Solution

- 7 Find the sum of 12,713 and 9,604. Show your work.

Solution

- 8 What is the missing digit that makes the sum correct?

$$\begin{array}{r} 8,245 \\ + 1,569 \\ \hline 9,\square 14 \end{array}$$

- (A) 6
(B) 7
(C) 8
(D) 9

Practice Using Strategies to Add

Study the Example showing two ways to add multi-digit numbers.
Then solve problems 1–6.

EXAMPLE

On Friday, 1,150 people attend the school play. On Saturday, 2,987 people attend the play. How many people attend the play on those two days?

Use a place-value strategy.

$$\begin{array}{r}
 1,150 \\
 + 2,987 \\
 \hline
 \end{array}$$

$7 \rightarrow 0 \text{ ones} + 7 \text{ ones} = 7 \text{ ones}$
 $130 \rightarrow 5 \text{ tens} + 8 \text{ tens} = 13 \text{ tens or } 1 \text{ hundred} + 3 \text{ tens}$
 $1,000 \rightarrow 1 \text{ hundred} + 9 \text{ hundreds} = 10 \text{ hundreds or } 1 \text{ thousand}$
 $+ 3,000 \rightarrow 1 \text{ thousand} + 2 \text{ thousands} = 3 \text{ thousands}$

$$\begin{array}{r}
 4,137
 \end{array}$$

Use the standard algorithm.

$$\begin{array}{r}
 \overset{1}{1},\overset{1}{1}50 \\
 + 2,987 \\
 \hline
 4,137
 \end{array}$$

4,137 people attend the play.

1 Show two ways to add 7,315 and 1,890.

2 Find the sum.

$$\begin{array}{r}
 1,025 \\
 + 4,589 \\
 \hline
 \end{array}$$



- 3 Last summer Mia’s family drove 1,024 miles from Grand Canyon National Park to Mount Rushmore National Memorial. Then they drove 1,389 miles from Mount Rushmore to Yosemite National Park. How many miles did they drive in all? Show your work.

Solution

- 4 Use the tiles below to find a number that makes each addition problem true. You may use a tile more than once.



$$\begin{array}{r}
 \\
 \\
 \hline
 3,
 \end{array}
 \qquad
 \begin{array}{r}
 \\
 \\
 \hline
 9,
 \end{array}$$

- 5 On Monday, Calvin runs 4,250 meters. On Tuesday, he runs 4,980 meters. How many meters does he run on Monday and Tuesday? Show your work.

Solution

- 6 Sam adds 6,152 and 379 and gets a sum of 9,942. Explain why Sam’s addition is incorrect and find the correct sum of $6,152 + 379$.

Develop Using the Standard Algorithm to Add Greater Numbers

Read and try to solve the problem below.

Find the sum of 57,541 and 23,098. Use the standard algorithm for addition. Then estimate to check whether your answer is reasonable, or makes sense.

TRY IT



Math Toolkit

- grid paper



DISCUSS IT

Ask your partner: Do you agree with me? Why or why not?

Tell your partner: I disagree with this part because ...

Explore how to use the addition algorithm to add and how to check your answer.

Find the sum of 57,541 and 23,098. Use the standard algorithm for addition. Then estimate to check whether your answer is reasonable, or makes sense.

MODEL IT

You can use the addition algorithm to add.

Line up the numbers. Add from right to left.

$$\begin{array}{r} 57,541 \\ + 23,098 \\ \hline \end{array}$$

Add the **ones**.

Add the **tens**.

39

Regroup if you need to.

Write the regrouped **1 hundred** above.

Then add hundreds, thousands, and ten thousands.

MODEL IT

You can estimate the sum to check your answer for reasonableness.

Round each number to the same place. Then add.

To the nearest thousand, 57,541 rounds to 58,000.

To the nearest thousand, 23,098 rounds to 23,000.

$$58,000 + 23,000 = 81,000$$



CONNECT IT

Now you will use the problem from the previous page to understand how to use the addition algorithm and how to check your answer.

- 1 Finish solving the problem in the first **Model It**.
Write your answers in the boxes.

$$\begin{array}{r}
 \square \\
 57,541 \\
 + 23,098 \\
 \hline
 \square\square,\square39
 \end{array}$$

- 2 Why do you need to regroup a second time?

- 3 Look at the second **Model It**. Is the estimate of 81,000 close to the sum you wrote in problem 1? Is your answer reasonable?

- 4 In the second **Model It**, each number is rounded to the nearest thousand. Could you estimate in different ways? For example, what are the benefits and drawbacks of rounding to the nearest ten instead of to the nearest thousand?

5 REFLECT

Look back at your **Try It**, think about your discussion with classmates, and look back at the first **Model It** and **Connect It** problem 1. Describe what you like or do not like about using the standard algorithm compared to other strategies you have seen in this lesson or used in the past to solve addition problems.

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APPLY IT

Use what you just learned to solve these problems.

- 6 Xavier is playing a video game. His score is 21,405 points in the first level and 17,865 points in the second level. What is Xavier's total score for both levels? Estimate to check that your answer is reasonable. Show your work.

Solution

- 7 Find the sum of the three numbers. Show your work.

2,591 43,218 75,043

Solution

- 8 What is the sum of 50,603 and 46,925?

- (A) 97,538
- (B) 97,528
- (C) 96,628
- (D) 96,528

Practice Using the Standard Algorithm to Add Greater Numbers

Study the Example showing how to use the addition algorithm to add five-digit numbers. Then solve problems 1–5.

EXAMPLE

Use the addition algorithm to find the sum of 72,160 and 44,983. Then estimate to check whether your answer is reasonable.

$$\begin{array}{r} ^1 ^1 \\ 72,160 \\ + 44,983 \\ \hline 117,143 \end{array}$$

Step 1: Line up the numbers by place value.

Step 2: Add the ones digits. Regroup if needed.

Step 3: Repeat **Step 2** for all other place values.

Estimate to check: $72,000 + 45,000 = 117,000$

117,000 is close to 117,143.

The answer is reasonable.

The sum of 72,160 and 44,983 is 117,143.

1 Add.

$$\begin{array}{r} 36,159 \\ + 42,903 \\ \hline \end{array}$$

2 Find the sum.

$$\begin{array}{r} 65,296 \\ + 8,172 \\ \hline \end{array}$$



- 3 Find the sum. Then estimate to check that your answer is reasonable. Show your work.

$$\begin{array}{r} 70,234 \\ 11,592 \\ + 16,890 \\ \hline \end{array}$$

- 4 Use the tiles below to find a number that makes each addition problem true. You may use a tile more than once.

1 2 3 4 5

$$\begin{array}{r} 39,500 \\ + \square\square,\square\square\square \\ \hline 53,725 \end{array}$$

$$\begin{array}{r} 89,417 \\ + \square\square,\square\square\square \\ \hline 110,870 \end{array}$$

- 5 There is a mistake in the addition shown. Explain how the mistake was made. Then find the correct sum.

$$\begin{array}{r} 22,365 \\ + 53,908 \\ \hline 75,373 \end{array}$$

Refine Adding Whole Numbers

Complete the Example below. Then solve problems 1–9.

EXAMPLE

Find the sum of 130,985 and 277,409.

Look at how you could show your work using the addition algorithm.

$$\begin{array}{r} ^1 ^1 ^1 \\ 277,409 \\ + 130,985 \\ \hline 408,394 \end{array}$$

Solution

The student regrouped three times to solve the problem.



PAIR/SHARE

How can you check that your answer is reasonable?

APPLY IT

- 1 The population of Turtle Valley is 407,989. The population of Art Creek is 86,966. What is the total population of the two cities? Show your work.

How can you line up the numbers to solve this problem?

Solution

PAIR/SHARE

To estimate the sum, what place can you round to?

2 Find the sum of the three numbers below.

13,728 15,419 12,399

Show your work.

Do you need to regroup?



Solution

3 Which equation can help you check the reasonableness of the answer to $361,788 + 65,235$?

- Ⓐ $30,000 + 70,000$
- Ⓑ $36,000 + 65,000$
- Ⓒ $360,000 + 70,000$
- Ⓓ $360,000 + 700,000$

Tyrone chose Ⓓ as the correct answer. How did he get that answer?

PAIR/SHARE

In what order did you add the numbers?

You can round each number to estimate a sum.

PAIR/SHARE

Does Tyrone's answer make sense?

4 Which equation can help you estimate the sum of 59,106 and 22,477?

- (A) $6,000 + 2,000 = 8,000$
- (B) $60,000 + 2,000 = 62,000$
- (C) $60,000 + 20,000 = 80,000$
- (D) $100,000 + 20,000 = 120,000$

5 What is the missing digit that makes the problem correct?

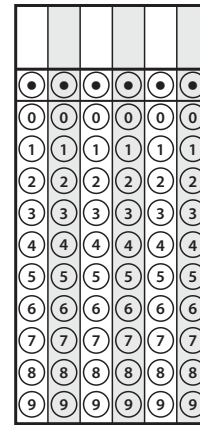
$$\begin{array}{r} 329,045 \\ 1\square7,620 \\ + 74,916 \\ \hline 561,581 \end{array}$$

- (A) 4
- (B) 5
- (C) 6
- (D) 7

6 Select all the correct addition equations.

- (A) $3,538 + 5,491 = 9,029$
- (B) $411,603 + 17,850 = 429,553$
- (C) $6,771 + 20,293 = 27,064$
- (D) $9,729 + 1,385 = 1,114$
- (E) $43,719 + 27,185 = 70,904$

- 7 Parkwood School has 1,165 students in seventh grade and 1,027 students in eighth grade. How many students are in both grades?



- 8 Find the sum of 9,618 and 132,501. Then estimate to check that your answer is reasonable. Show your work.

Solution

9 MATH JOURNAL

Write an addition problem that has no regrouping. Each addend must have at least four digits. Explain why you do not need to regroup.



SELF CHECK Go back to the Unit 1 Opener and see what you can check off.