

Student Guide

Workshop: Multiplication with Larger Numbers

Questions 1–28 (SG pp. 291–295)

- \$678; Possible response using mental math:
 $3 \times \$225 = \675 and add $\$3 = \678 .
- Luis and his sister can each go to camp for 1 week. Half of \$500 is \$250 and \$250 is more than \$226.
- No. Possible response. They now have a total of \$750 because $\$500 + 2 \times \$125 = \$750$. They need $4 \times \$226$ for both children to go to camp for 2 weeks which would cost \$904. That is more than the \$750 they have.
- \$625; Multiplication methods will vary. Using mental math:
 $5 \times \$100 = \500 and $5 \times \$25 = \125 .
 $\$500 + \$125 = \$625$.

- 480 families;
 $120 \text{ campsites} \times 4 \text{ campgrounds} = 480 \text{ campsites (one family per campsite)}$
- $960 \text{ tents; } 480 \text{ campsites} \times 2 \text{ tents} = 960 \text{ tents}$
- Yes, the supplies total about \$50;
 $20 + 4 + 25 + 4$ is a little more than \$50. So \$60 is enough money to pay for the supplies; an estimate is a good choice because an exact answer is not needed.
- \$70 for firewood; $\$25 \times 2 \text{ bundles} = \50 ,
 $\$10 \times 2 = \20 , $\$50 + \$20 = \$70$
- 5040; $254 \times \$10 = \2540 , $100 \times \$25 = \2500 . So, $\$2540 + \$2500 = \$5040$

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Workshop: Multiplication with Larger Numbers

Discuss

Going to Camp
 ✓ Self-Check: Questions 1-4

Show your thinking for each problem you solve. On your paper, circle the problems for which you chose estimation as the most efficient strategy.

- Luis is going to outdoor education camp this summer. The camp is \$226 each week. Luis really wants to go for three weeks. How much is that going to cost?
- Luis's sister wants to go to camp, too. Their family has \$500 for camp this summer. Can Luis and his sister go to camp? For how many weeks?
- Grandpa Joe gives Luis and his sister each \$125 to add to the family's money. Do the two children have enough money now to go to camp for two weeks?
- Grandpa Joe gives each of his five grandchildren \$125 to go to camp. How much money does he give to his grandchildren altogether?

Use the Self-Check Questions and the menu to check your progress and choose practice.

Can I Do This?	Working On It! I could use some extra help.	Got It! I'm ready for a challenge.
Choose good strategies.	● Q# 5-11, 22	■ Q# 12-22

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Setting Up Camp

Show your thinking for each problem you solve. On your paper, circle the problems for which you chose estimation as the most efficient strategy.

A campground is a big area where many people can pitch their tents. A campground is divided into campsites. Each family that camps at the park gets a campsite.

- There are four campgrounds in the park. Each campground has 120 campsites. How many families can stay at the park at one time?
- Ana's family pitches two tents on their campsite. If two tents were pitched at every campsite in the state park, how many tents would there be in the park?
- Ana's family needed some additional supplies for their camping trip. A list of the items and prices are listed below.

Need	Item	Cost
1	Bug Spray	\$3.25 each
1	Lantern	\$25.00 each
2	Bag of ice	\$2.00 each
5	Rain ponchos	\$9.50 each

Ana's mother has \$60. Does she have enough money to buy the supplies? Explain your thinking.

- The state park sells firewood for \$25 for a large bundle and \$10 for a small bundle. Ana's family purchases two large bundles and two small bundles during their stay. How much money did they spend on firewood?
- The state park sold 254 small bundles of firewood and 100 large bundles during one weekend. How much money did the state park collect by selling firewood?

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- 10. Ana's older brother, Felipe, is hanging a clothesline to dry towels. He wants to hang three lines at different heights between two trees. He measures the distance between the trees to be about 17 feet and plans to tie the ropes to the trees. How much rope would you tell Felipe to get to put up the three clotheslines? Explain your answer.
- 11. Ana's parents ask the children to help put up the tent. Ana looked at her watch when they began. It was 2:06. They finish setting up the tent at 2:52. How long did it take them to set up the tent?

Camping Adventures

Show your thinking for each problem you solve. On your paper, circle the problems for which you chose estimation as the most efficient strategy.

Ana, who is 10 years old, is camping with her 12-year-old brother Felipe, her 5-year-old sister Dalia, and her parents.

- 12. One evening, Ana and her family eat dinner at a restaurant in a nearby town. The restaurant had an "all-you-can-eat" fish dinner. The cost is \$7.00 for adults, \$5.00 for children ages 6–11, and \$2.50 for children ages 3–5. If the whole family orders the fish dinner, how much will the total bill be?

Ana's 11-year-old cousin Roberto, his mother, and his little sister Angela come to the park on Friday. The families decide to go canoeing together. It costs \$8.00 to rent a canoe for 1 hour. Each canoe holds 3 people.

- 13. Every person who is in a boat needs a life jacket. How many adult life jackets do they need? (Adults are ages 12 and up.) How many children's life jackets do they need?
- 14. How many canoes will they need to rent? There must be at least one adult in every canoe. (Adults are ages 12 and up.) They don't want to spend more money on rental than they have to. Draw a picture of how Ana's and Roberto's families can seat themselves in the canoes.



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- 10. At least 60 feet of rope. Round 17 up to 20; $20 \times 3 = 60$. It's a good idea to round up, because you need enough rope to go around the trees and be tied in knots. Depending on the size of the trees, you may need more rope.
- 11. 46 minutes; $2:52 - 2:06 = 46$ minutes
- 12. \$28.50; $\$7 + \$7 + \$7 + \$5 + \$2.50 = \28.50
- 13. 4 adult life jackets and 4 children's life jackets.
- 14. 3 canoes; pictures may vary. One will have 1 adult and 2 children, a second canoe will have 2 adults (including Felipe) and 1 child, and the third canoe will have 1 adult and 1 child.

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- 15. How much will they have to pay to canoe for 1 hour?
- 16. How much will they have to pay to canoe for 2 hours?
- 17. A. After canoeing, Ana's and Roberto's families decide to stop for frozen yogurt at the snack shop. A single-clip cone is 69¢. The price includes tax. Estimate how much money is needed to buy a cone for every person in both families.
B. Ana gives the cashier \$10.00 to pay for all the cones. About how much change will she get back?
- 18. The families decide to go on a long hike Saturday morning. Ana's father brought ingredients to make gorp. Gorp is a high-energy snack that is easy to take on a hike. Here is his recipe for 4 servings of gorp:

GORP

1	cup raisins	
1	cup peanuts	
1	cup dried apples	
1	cup dates	
1	cup almonds	
1	cup dried apricots	

Ana's father wants to make a serving of gorp for everybody who is hiking. How many servings of gorp does he need to make?

- 19. How many cups of peanuts should he use?
- 20. How many cups of dried apricots should he use?
- 21. Driving home from their vacation, Roberto's mother says they will travel about 50 miles in 1 hour. It takes them about 6 hours to get home. About how far is the park from their home?
- 22. Make up a story for each of the multiplication problems below and solve the problems. Your story can be about camping or anything else.

$\begin{array}{r} 12 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 1.75 \\ \times 8 \\ \hline \end{array}$
---------------------------------------------------------	--------------------------------------------------------	-----------------------------------------------------------

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- 15. \$24; $\$8 \times 3 = \24
- 16. \$48; $\$8 \times 3 \times 2 = \48
- 17. A. Estimates will vary. One possible solution: About \$5.60; $8 \times 70¢ = \$5.60$: an estimate is a good choice because a quick answer is needed.
B. Estimates will vary. One possible solution: \$4.40; $\$10 - \$5.60 = \$4.40$: an estimate is a good choice because an exact answer is not needed.
- 18. 8 servings because there are 8 people between the two families.
- 19. 2 cups of peanuts
- 20. 1 cup of dried apricots
- 21. About 300 miles; $50 \text{ miles} \times 6 \text{ hours} = 300$ miles; estimate is a good choice because an exact answer is not needed.
- 22. Stories will vary. 96; 48; \$14.

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23. \$80 to camp for 5 nights;
 $\$16 \times 5 \text{ nights} = \80
24. \$60 to camp for 5 nights;
 $\$12 \times 5 \text{ nights} = \60
25. \$20 more; $\$80 - \$60 = \$20$
26. No, he does not have enough money,
 $\$16 \times 3 = \48 , $\$80 + \48 is more than \$100;
 an estimate is good choice, because we do not
 need an exact answer.
27. \$315; $\$105 \times 3 \text{ nights} = \315
28. \$384; $9 \times \$16 = \144 , $20 \times \$12 = \240 ,
 $\$240 + \$144 = \$384$

Camping Fees

Show your thinking for each problem you solve. On your paper, circle the problems for which you chose estimation as the most efficient strategy.

✓ **Check-In: Questions 23-28**

Ana and her family are going camping at the Potawatomi (pod-a-wad-to-mi) State Park in Wisconsin. The fee to camp in the park is \$12.00 a night for families who live in Wisconsin and \$16.00 a night for people who do not live in Wisconsin.

23. Ana's family is arriving on Tuesday and staying until Sunday afternoon. Ana's family lives in Illinois. How much does Ana's family have to pay?

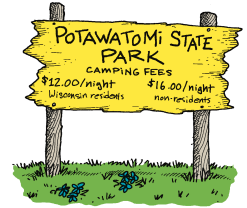
24. Nadia, a fourth grader from Milwaukee, Wisconsin, is also camping from Tuesday until Sunday. How much does Nadia's family pay to stay at the park?

25. How much more does Ana's family pay than Nadia's? Explain how you decided.

26. Ana's family decides to stay at the park another 3 nights. Ana's father brought \$100 to pay the camping fees. Does he have enough money for all the nights?

27. The Smith family decides to have their family reunion at Potawatomi State Park. The large group campsites are \$105 per night. The family reunion starts Thursday afternoon and ends Sunday afternoon. How much does the Smith family have to pay?

28. One night in August, there are 9 out-of-state families and 20 Wisconsin families camping at the state park. How much money did the park collect in camping fees that night?



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Student Activity Book

Practicing Multiplication Strategies

Questions 1–16 (SAB pp. 239–246)

1. A. 30; 2000; 36
 B. $539 = 500 + 30 + 9$
 C. 4 and 500; $4 \times 500 = 2000$
2. A. 80; 1200; 80; 7; 21
 B. $487 = 400 + 80 + 7$
 C. 3 and 80; $3 \times 80 = 240$
3. A. 600; 32,000; 600; 280; 32,000; 280
 B. $8679 = 8000 + 600 + 70 + 9$
 C. It represents 2 thousands that were carried over by multiplying $4 \times 600 = 2400$ and adding the carried over 300.
 D. In the box where 4 and 600 are multiplied to get 2400.
4. A. $7 \times 70 = 490$; $7 \times 6 = 42$; 490; 42
 B. $2000 + 800 + 30 + 6$; 4000; 30
 C. 450, 18

Name _____ Date _____

Practicing Multiplication Strategies

Connecting Methods

✓ **Self-Check: Question 1**

Use the *Multiplication Strategies Menu for Larger Numbers* in the *Student Guide Reference* section to help you solve each problem.

1. Irma solved 4×539 using rectangles.

500	30	9	
$4 \times 500 = 2000$	$4 \times 30 = 120$	$4 \times 9 = 36$	$\begin{array}{r} 2000 \\ 120 \\ + 36 \\ \hline 2156 \end{array}$

A. Use her rectangles to fill in the blanks for the same problem using expanded form.

$539 = 500 + \square + 9$

$\begin{array}{r} 539 \\ \times 4 \\ \hline \end{array} = 2156$

B. Write a number sentence to show how Irma broke apart 539.

Number sentence: _____

C. What numbers did Irma multiply in both problems to get 2000?

Use the *Self-Check Questions* and the menu to check your progress and choose practice with using multiplication methods.

Can I Do This?	Working On It!	Getting It!	Got It!
 Show that I understand multiplication methods. Make connections between methods.	 I could use some extra help.	 I just need some more practice.	 I'm ready for a challenge.
★Q# 1, 2, 4–6, 9, 12	●Q# 2, 4, 6–10, 12	■Q# 3, 4, 7–12	

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★●2. John solved 487×3 using the all-partials method.

400	7	
$3 \times 400 = \square$	$3 \times \square = 240$	$3 \times \square = 21$

$$\begin{array}{r} 487 \\ \times 3 \\ \hline 21 \\ 240 \\ 1200 \\ \hline 1461 \end{array}$$

A. Complete the same problem using the rectangle method. Fill in the boxes with the correct numbers.

B. Write a number sentence to show how John broke apart 487.

Number sentence: _____

C. What numbers did he multiply in both problems to get 240?

■3. Ana solved 8679×4 using the compact method.

8000	70	9	
$4 \times 8000 = \square$	$4 \times \square = 2400$	$4 \times 70 = \square$	$\begin{array}{r} 8679 \\ \times 4 \\ \hline 34,716 \end{array}$

$$\begin{array}{r} 1200 \\ 240 \\ + \square \\ \hline 1461 \end{array}$$

A. Fill in the rectangles for the same problem.

B. Write a number sentence to show how Ana broke apart 8679.

Number sentence: _____

C. What does the little 2 above the 8 in the compact method represent?

D. Where is the same 2 in the rectangle method?

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★●4. Professor Peabody's cat had muddy feet and walked across some problems. Fill in the muddy spots to show the problems correctly.

A. 7×476

400	70	6	
$7 \times 400 = 2800$			$\begin{array}{r} 2800 \\ + \square \\ \hline 3332 \end{array}$

B. 2836×5

$$\begin{array}{r} 2836 \\ \times 5 \\ \hline 10,000 + \square + 150 + \square = 14,180 \end{array}$$

C. 9×452

$\begin{array}{r} 452 \\ \times 9 \\ \hline 3600 \\ \square \\ \hline 4068 \end{array}$

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5. 350
6. 400; 5; 240
7. 4200; 630; 4858
8. 140; 18,000
9. $300 \times 3 = 900$.
 298×3 will be 2×3 or 6 less.
 $900 - 6 = 894$. $298 \times 3 = 894$
10. Cut 486 in half to get 243. Double 5 to get 10.
 $10 \times 243 = 2430$. $5 \times 486 = 2430$.
11. 252 is like \$2.52. $3 \times \$2.50$ is \$7.50.
 $3 \times 2\text{¢} = 6\text{¢}$. Add in 6¢ to get \$7.56.
 So $252 \times 3 = 756$.
12. Paper-and-pencil and mental math strategies will vary.
 - A. 3736; Possible paper-and-pencil strategy:

$$\begin{array}{r} 467 \\ \times 8 \\ \hline 3200 + 480 + 56 = 3736 \end{array}$$
 - B. 1196; Possible mental math strategy:
 $4 \times 300 = 1200$. 299 is one less than 300.
 $4 \times 1 = 4$. $1200 - 4 = 1196$.
 $4 \times 299 = 1196$
 - C. 1020; Possible mental math strategy:
 204 is like \$2.04. $5 \times \$2.00 = \10.00 .
 $5 \times 4\text{¢} = 20\text{¢}$. Add 20¢ to get \$10.20, so
 $204 \times 5 = 1020$.

Name _____ Date _____

For Questions 5–8, fill in the boxes to complete the problems.

★5.
$$\begin{array}{r} 54 \\ \times 7 \\ \hline \square \\ + 28 \\ \hline 378 \end{array}$$


★6. $485 = \square + 80 + \square$

$$\begin{array}{r} \times 3 \\ \hline 1200 + \square + 15 = 1455 \end{array}$$


●7.
$$\begin{array}{r} 694 \\ \times 7 \\ \hline \square \\ \square \\ + 28 \\ \hline \square \end{array}$$

●8.
$$\begin{array}{r} 9876 \\ \times 2 \\ \hline 12 \\ \hline 1600 \\ \hline \square \\ \hline 19,752 \end{array}$$


★●9. Here is how Grace solved 298×4 . Show how Grace would solve 298×3 .




$300 \times 4 = 1200$
 298×4 will be 2×4 or 8 less.
 $1200 - 8 = 1192$
 $298 \times 4 = 1192$



●10. Jerome knows that 5 is half of 10. Here is how he solved 5×644 . Show how Jerome would solve 5×486 .



Cut 644 in half to get 322.
 Double 5 to get 10.
 $10 \times 322 = 3220$
 $5 \times 644 = 3220$




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
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★11. Here is how Maya solved 252×4 . Show how Maya would solve 252×3 .




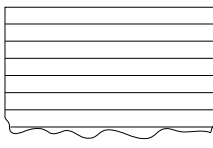
252 is like \$2.52
 $4 \times \$2.50$ is \$10.00
 $4 \times 2\text{¢} = 8\text{¢}$
 Add in 8¢ to get \$10.08
 so $252 \times 4 = 1008$




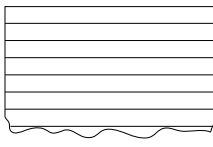
★●12. Solve the problems. Solve at least one problem using mental math and at least one using paper and pencil. Show your mental math solutions in the thought bubbles. Show your paper-and-pencil solutions on the note pads with lines.

A. 467×8 B. 299×4 C. 204×5









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


Using Different Methods

✓ **Self-Check: Question 13**

Use the *Multiplication Strategies Menu for Larger Numbers* in the *Student Guide* Reference section to help you.

13. Solve 324×8 using three different strategies or methods.

Use the Self-Check Question and the menu to check your progress and choose practice with multiplication strategies and methods.

Can I Do This?	Working On It! 	Getting It! 	Got It! 
Use different methods to multiply large numbers by 1-digit numbers.	★ Q# 14–16 Use each of these methods at least once: <ul style="list-style-type: none"> • rectangle • all-partials • expanded form 	● Q# 14–16 Use each of these methods at least once: <ul style="list-style-type: none"> • rectangle • all-partials • expanded form • compact method 	■ Q# 14–16 Use each of these methods at least once: <ul style="list-style-type: none"> • rectangle • all-partials • expanded form • compact method

13. Strategies and methods will vary. Some possible responses:

	300	20	4
4	1200	80	16
4	1200	80	16

$$2400 + 160 + 32 = 2592$$

$$\begin{array}{r} 324 \\ \times 8 \\ \hline 2400 \\ 160 \\ + 32 \\ \hline 2592 \end{array}$$

$$\begin{array}{r} 300 + 20 + 4 \\ \times 8 \\ \hline 2400 + 160 + 32 = 2592 \end{array}$$

Answer Key • Lesson 8: Workshop: Multiplication with Larger Numbers

Methods and strategies will vary. One possible method is given for each problem. Look for evidence that students are choosing strategies that “fit” the problem.

14. A. 240 ; $10 \times 48 = 480$
 $480 \div 2 = 240$

B. 2036 ; $500 \times 4 = 2000$;
 $9 \times 4 = 36$;
 $2000 + 36 = 2036$

C. 7578 ; 842

$$\begin{array}{r} 842 \\ \times 9 \\ \hline 18 \\ 360 \\ \hline 7200 \\ 7578 \end{array}$$

D. 3858 ;

$$\begin{array}{r} 600 + 40 + 3 \\ \times 6 \\ \hline 3600 + 240 + 18 = 3858 \end{array}$$

E. 2772 ; 924

$$\begin{array}{r} 924 \\ \times 3 \\ \hline 2772 \end{array}$$

F. 2784 ; $300 \times 8 = 2400$
 $50 \times 8 = 400$

$$\begin{array}{r} 2800 \\ - 16 \\ \hline 2784 \end{array}$$

$2 \times 8 = 16$

G. 1340 ; $268 \times 10 = 2680$
 $2680 \div 2 = 1340$

H. $49,448$; 7064

$$\begin{array}{r} 7064 \\ \times 7 \\ \hline 28 \\ 420 \\ \hline 49,000 \\ 49,448 \end{array}$$

15. Answers will vary. A possible solution for Question 14A:

$5 \times 50 = 250$;
 $5 \times 2 = 10$;
 $250 - 10 = 240$

16. Answers will vary. A possible solution for Question 14H:

$7 \times 7000 = 49,000$

The answer should be a few hundred more than 49,000.

Name _____ Date _____

★●■14. Choose your own strategies and methods to solve the following problems. Remember to estimate to check that your answers are reasonable.

A. 5×48 B. 4×509

C. 842×9 D. 6×643

E. 3×924 F. 348×8

G. 268×5 H. 7064×7

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★●■15. Choose a problem from the ones you just solved and show how you could solve it using mental math.

★●■16. Choose a different problem and show your estimation strategy. Was your answer reasonable? Why or why not?

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Play the Multiplication Digits Game with a partner or family member to practice using place value concepts to multiply.

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