

Workshop: Division Strategies

Solve the problems and show your work. Use the *Division Strategies Menu* in the *Student Guide* Reference section.

✓ **Self-Check: Question 1**

- Jackie is organizing stickers for prizes for each of the games for the school fair. There are 8 games and 1080 stickers. Each game will need the same amount of stickers. Jackie wonders how many stickers she should put at each game.
 - Estimate the number of stickers Jackie should put at each game.
 - Solve the problem using partial quotients.
 - Solve the problem using a rectangle model.
 - Solve the problem using the column method.

Use Self-Check: Question 1 and the Workshop Menu to review your progress with dividing multidigit numbers by one- and two-digit divisors.

Workshop Menu

Can I Do This?	Working On It!	Getting It!	Got It!
Solve a multidigit division problem. Estimate quotients.	★ Q# 2-5, 10-11, 12A-D	● Q# 5-11, 12C-F	■ Q# 6-12C-H

Copyright © Kendall Hunt Publishing Company

Workshop: Division Strategies

SG • Grade 5 • Unit 7 • Lesson 4 315

Student Activity Book - Page 315

Student Guide

Workshop: Division Strategies

(SG pp. 315–319)

Questions 1–12

I. **A.*** Estimates will vary. Possible response: 150; I thought $8 \times 100 = 800$, but that was too low. $8 \times 200 = 1600$, and that is too high, so I estimated 150 stickers because it was in the middle.

B. 135 Stickers

$$\begin{array}{r} 8 \overline{)1080} \quad 100 \\ - 800 \\ \hline 280 \quad 30 \\ - 240 \\ \hline 40 \quad 5 \\ - 40 \\ \hline 0 \quad 135 \end{array}$$

C. 8

$8 \times 100 = 800$	100	1080
		$- 800$
		280
$8 \times 300 = 240$	300	$- 240$
		40
$8 \times 5 = 40$	5	$- 40$
		0

D.

	Into the bins	Amount Remaining
5	40	0
30	240	40
100	800	280
1		
2		
3		
4		
5		
6		
7		
8		

Copyright © Kendall Hunt Publishing Company

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

2. **A.** 10
B. 8 or 80
C. The lollipops are grouped in 10 bunches of 8. 80 lollipops have been put in bunches.
D. 10
E. 44 lollipops are not in bunches of 8 yet.
F. 5
G. 25 bunches of lollipops.
H. 4 lollipops
3. 40 popcorn balls; $200 \div 5 = 40$ popcorn balls
4. 121 toys; $363 \div 3 = 121$ toys
5. **A.** Estimation strategies will vary. Possible response: It's more than 12 and less than 20, $9 \times 12 = 108$ and $9 \times 20 = 180$, so between 12 and 20 balloons.
B. Answers will vary. Two possible responses: 17 balloons on each table with 2 balloons left over or 17 balloons on 7 tables and 8 balloons on 2 tables.
C. Possible response: My answer is between 12 and 20 balloon per table so it's reasonable.
6. **A.** 324 strips; $27 \times 12 = 324$ strips
B. 81 strips; $324 \div 4 = 81$ strips
7. 41 R5 toys; $456 \div 11 = 41$ R 5; 5 toys will be left over
8. **A.** Estimates will vary. Possible response: about 200
B. 176 sets of 25 tickets; $4400 \div 25 = 176$

- ★2. Rosa has 204 lollipops. She is going to divide them into bunches of 8. How many bunches will she have? Will any lollipops be left over? Help Rosa think through her solution.

$$\begin{array}{r} 8 \overline{)204} \quad 10 \\ \underline{-80} \\ 124 \quad 10 \\ \underline{-80} \\ 44 \quad 5 \\ \underline{-40} \\ 4 \quad 25 \end{array}$$

- A.** First try: _____ bunches of eight.
B. You have used $10 \times$ _____ or _____ lollipops.
C. What does the 80 mean?
D. Second try: _____ bunches of eight.
E. What does the 44 mean?
F. Next try: _____ bunches of eight.
G. How many bunches of 8 lollipops does she have?
H. How many lollipops are left over?

- ★3. Five parents made 200 popcorn balls to sell at the school fair. Each parent made the same number. How many popcorn balls did each parent make?
- ★4. Three stores gave 363 toys for prizes at the school fair. Each store gave the same number of toys. How many did each store give?
- ★5. The boys and girls decorated the tables with balloons. They used 155 balloons for 9 tables. They planned to put the same number on each table.
A. Estimate the number of balloons on each table. Is it less than 10? More than 10? More than 12? Less than 20?
B. How many did they put on each table?
C. Show or tell how you know your answer is reasonable.
- ★6. The students decorated the gym with 27 packages of crepe paper. They cut the paper in each package into 12 strips.
A. How many strips did they have altogether?
B. They wanted to decorate the four walls of the gym. How many strips could they use on each wall?
- ★7. Kathy is making surprise packages for the grab bag at the school fair. She has 456 small toys. She wants to put 11 toys in each box. How many boxes of 11 toys will she have? Will any toys be left over?
- ★8. There are 1100 tickets in one roll and Jerome has 4 rolls of tickets. He needs to make sets of 25 tickets. How many sets can Jerome make?
A. Estimate the number of sets of 25 tickets.
B. Find the exact number of sets Jerome can make.

Copyright © Kendall Hunt Publishing Company

Student Guide - Page 316

- 9. Suzanne wants to create a photo album of 278 school fair pictures. Six pictures fit on each album page.

$$\begin{array}{r} 6 \overline{)278} \quad 42 \\ \underline{246} \\ 32 \quad 5 \\ \underline{30} \\ 2 \quad 47 \end{array}$$

I will need 48 photo album pages.

- A. How many pages will she need?
 B. Look at Suzanne's solution to the right. Do you agree with her solution? Why or why not?
 C. What would you tell Suzanne?
- ★●●10. Levi and Nila organized 375 name tags into 5 groups on the welcome table. They used division to find out how many name tags to put in each group.

Levi solved the problem this way:

$$\begin{array}{r} 5 \overline{)375} \quad 20 \\ \underline{100} \\ 275 \\ \underline{200} \\ 75 \\ \underline{50} \\ 25 \\ \underline{25} \\ 75 \end{array}$$

Nila solved the problem this way:

$$\begin{array}{r} 5 \overline{)375} \quad 50 \\ \underline{250} \\ 125 \\ \underline{100} \\ 25 \\ \underline{25} \\ 75 \end{array}$$

- A. How are Levi's and Nila's solutions alike? How are they different?
 B. What is Levi's first partial quotient?
 C. What is Nila's first partial quotient?
 D. Which partial quotient would you start with? Why?
 E. Who used fewer steps? How did he or she do that?
 F. Can you solve this problem using fewer steps? If so, how?

Copyright © Kendall Hunt Publishing Company

9. A. 47 pages; $278 \div 6 = 46 \text{ R}2$ or 47 pages.
 B. No. Suzanne made a multiplication error. She would have caught that error had she estimated with convenient numbers.
 C. Use convenient numbers to estimate to do mental computation. Check your quotient by using multiplication.
10. A. Both Levi and Nila used the partial quotient method and they got the same answer. They used different partial quotients. Levi used more steps.
 B. 20
 C. 50
 D. Responses will vary. Some students may say that they know 20×5 is 100 and that is easy to multiply and subtract. Others may say they want to start with a larger number so they will not have as many steps.
 E. Nila used fewer steps because her first try was a larger number so she subtracted more toys sooner.
 F. Possible response:

$$\begin{array}{r} 5 \overline{)375} \quad 70 \\ \underline{350} \\ 25 \\ \underline{25} \\ 75 \end{array}$$

11. A. Estimates will vary. Possible response: about 250 cups of counters; I thought 9 times what is about 2225. $9 \times 200 = 1800$ and $9 \times 300 = 2700$, so somewhere in between 200 and 300.

Into Bins	Amount Remaining
63	2
360	65
1800	425

C.

247 R2	
9 $\overline{) 2225}$	200
— 1800	
425	40
— 360	
65	7
— 63	
2	

- D. 247 cups of counters
 E. 2 counters are left over. That is what the remainder 2 means in the solution.

12. Answers will vary. Two sample solutions are given for each problem.

A. 25 R2;

Partial Quotients

Mental Math

25 R2	
4 $\overline{) 102}$	10
40	
62	10
40	
22	5
20	
2	25

I think about money. There are 4 quarters in one dollar, so 4×25 cents = 100 cents. There are two cents left over. So the answer is 25 R2.

B. 95;

Partial Quotients

Mental Math

3 $\overline{) 285}$	50
150	
135	40
120	
15	5
	95

My cluster of problems:

$$3 \times 90 = 270$$

$$3 \times 5 = 15$$

$$285$$

so, $285 \div 3 = 90 + 5 = 95$

✓ Check-In: Questions 11-12

11. Miguel is placing counters in cups for a bingo game. He has a package of 2225 counters. Each bingo card needs a cup of at least 9 counters.

- A. Show or tell how to estimate the number of cups of counters Miguel can prepare.
 B. Miguel wants to find out exactly how many cups he can prepare. He started to solve the problem this way. Finish his work.

Into Bins	Amount Remaining
7	
40	
200	
1	
2	
3	
4	
5	
6	
7	
8	
9	

- C. Show or tell how to complete the problem using the same partial quotient Miguel did in his solution above.

9 $\overline{) 2225}$	
—	
—	
—	
—	
—	

- D. How many cups of counters can Miguel prepare? Include a label.
 E. Are there any leftover counters? How do you know?

Student Guide - Page 318

12. Solve the following problems using two different strategies. Choose each of the strategies from the *Division Strategies Menu* at least once. Circle the strategy you think worked best for the problem.

★ A. $102 \div 4$

★ B. $285 \div 3$

★● C. $5 \overline{) 671}$

★●● D. $6300 \div 90$

●● E. $719 \div 12$

●● F. $5844 \div 4$

■ G. $27 \overline{) 8761}$

■ H. $20 \overline{) 4420}$

Student Guide - Page 319

Answer Key • Lesson 4: Workshop: Division Strategies

C. 134 R1;
Column Method

	Into the bins	Amount Remaining
4	20	①
10	50	21
20	100	71
100	500	171
1	2	3
4	5	

Partial Quotient

$$\begin{array}{r}
 134 \text{ R1} \\
 5 \overline{) 671} \quad | \quad 100 \\
 \underline{- 500} \\
 171 \quad | \quad 20 \\
 \underline{- 100} \\
 71 \quad | \quad 10 \\
 \underline{- 50} \\
 21 \quad | \quad 4 \\
 \underline{- 20} \\
 1
 \end{array}$$

E. 59 R11;
Partial Quotient

$$\begin{array}{r}
 59 \text{ R11} \\
 12 \overline{) 719} \quad | \quad 50 \\
 \underline{- 600} \\
 119 \quad | \quad 9 \\
 \underline{- 108} \\
 11 \quad | \quad 59
 \end{array}$$

Mental Math

$$\begin{aligned}
 12 \times 60 &= 720 \\
 12 \times \textcircled{50} &= 600 \\
 719 - 600 &= 119 \\
 12 \times 10 &= 120 \\
 12 \times \textcircled{9} &= 108 \\
 119 - 108 &= 11 \\
 59 \text{ R11}
 \end{aligned}$$

G. 324 R13;
Rectangle Model

27	100	8761
$27 \times 100 = 2700$	100	$8761 - 2700 = 6061$
$27 \times 200 = 5400$	200	$6061 - 5400 = 661$
$27 \times 20 = 540$	20	$661 - 540 = 121$
$27 \times 4 = 108$	4	$121 - 108 = 13$
	324	13

Partial Quotient

$$\begin{array}{r}
 324 \text{ R13} \\
 27 \overline{) 8761} \quad | \quad 300 \\
 \underline{- 8100} \\
 661 \quad | \quad 20 \\
 \underline{- 540} \\
 121 \quad | \quad 4 \\
 \underline{- 108} \\
 13
 \end{array}$$

D. 70;
Mental Math

$$\begin{aligned}
 90 \times ? &= 6300 \\
 90 \times 7 &= 630 \\
 90 \times 70 &= 9 \times 10 \times 7 \times 10 \\
 &= 63 \times 100 \\
 &= 6300
 \end{aligned}$$

Partial Quotients

$$\begin{array}{r}
 70 \\
 90 \overline{) 6300} \quad | \quad 50 \\
 \underline{- 4500} \\
 1800 \quad | \quad 20 \\
 \underline{- 1800} \\
 0 \quad | \quad 70
 \end{array}$$

F. 461;
Partial Quotient

$$\begin{array}{r}
 1461 \\
 4 \overline{) 5844} \quad | \quad 1000 \\
 \underline{- 4000} \\
 1844 \quad | \quad 100 \\
 \underline{- 400} \\
 1444 \quad | \quad 200 \\
 \underline{- 800} \\
 644 \quad | \quad 100 \\
 \underline{- 400} \\
 244 \quad | \quad 50 \\
 \underline{- 200} \\
 44 \quad | \quad 11 \\
 \underline{- 44} \\
 0
 \end{array}$$

Mental Math

4	1000	5844
$4 \times 1000 = 4000$	1000	$5844 - 4000 = 1844$
$4 \times 200 = 800$	200	$1844 - 800 = 1044$
$4 \times 250 = 1000$	250	$1044 - 1000 = 44$
$4 \times 11 = 44$	11	$44 - 44 = 0$
	1461	

H. 221;
Mental Math

$$\begin{aligned}
 4420 \div 2 &= 2210 \\
 2210 \div 10 &= \textcircled{221}
 \end{aligned}$$

Partials Quotients

$$\begin{array}{r}
 221 \\
 20 \overline{) 4420} \quad | \quad 200 \\
 \underline{- 4000} \\
 420 \quad | \quad 20 \\
 \underline{- 400} \\
 20 \quad | \quad 1 \\
 \underline{- 20} \\
 0 \quad | \quad 221
 \end{array}$$