TOPIC 5

Use Models and Strategies to Divide Whole Numbers

Essential Question: What is the standard procedure for division and why does it work?

One of the hottest summers ever in the U.S. was in 2012.

More iced tea, anybody? Here's a project on finding the average temperature using division.

Math and Science Project: Average Temperature

Do Research Use a weather site from the Internet or another source of daily weather reports to find the average daily temperature for your city or town for every day of one month. The average daily temperature is the average temperature for a whole 24-hour period.

Journal: Write a Report Include what you found about daily temperatures. Also in your report:

- Find the average daily high temperature for the month. Which day had the greatest high temperature?

- Find the average daily low temperature for the month. Which day had the least low temperature?

- Make up and solve division problems based on your data.

Review What You Know

A-Z Vocabulary

Choose the best term from the box.
Write it on the blank.

• dividend	• quotient
• divisor	• remainder

1. In the equation $80 \div 10 = 8$, the number 80 is the _____.

2. The number used to divide another number is the _____.

3. The result of dividing two numbers is the _____.

Multiplication and Division

Multiply or divide.

4. $630 \div 9$

5. $480 \div 6$

6. $755 \div 5$

7. $657 \div 9$

8. 57×13

9. 71×109

10. For the state fair next month, 132 people volunteered to plan the fair's activities. The volunteers formed 12 equal groups. How many volunteers were in each group?

11. A town is holding a competition for various athletic games. Each community has 14 players. There are 112 communities competing in the games. How many players are competing?

   Ⓐ 1,676   Ⓑ 1,568   Ⓒ 126   Ⓓ 98

Estimate

12. A county has a goal to build 12,000 bus stop shelters in 48 months. If the county builds 215 bus shelters each month, will it reach its goal? Explain one way to estimate the answer.

5:1 ... use patterns and mental math to divide.
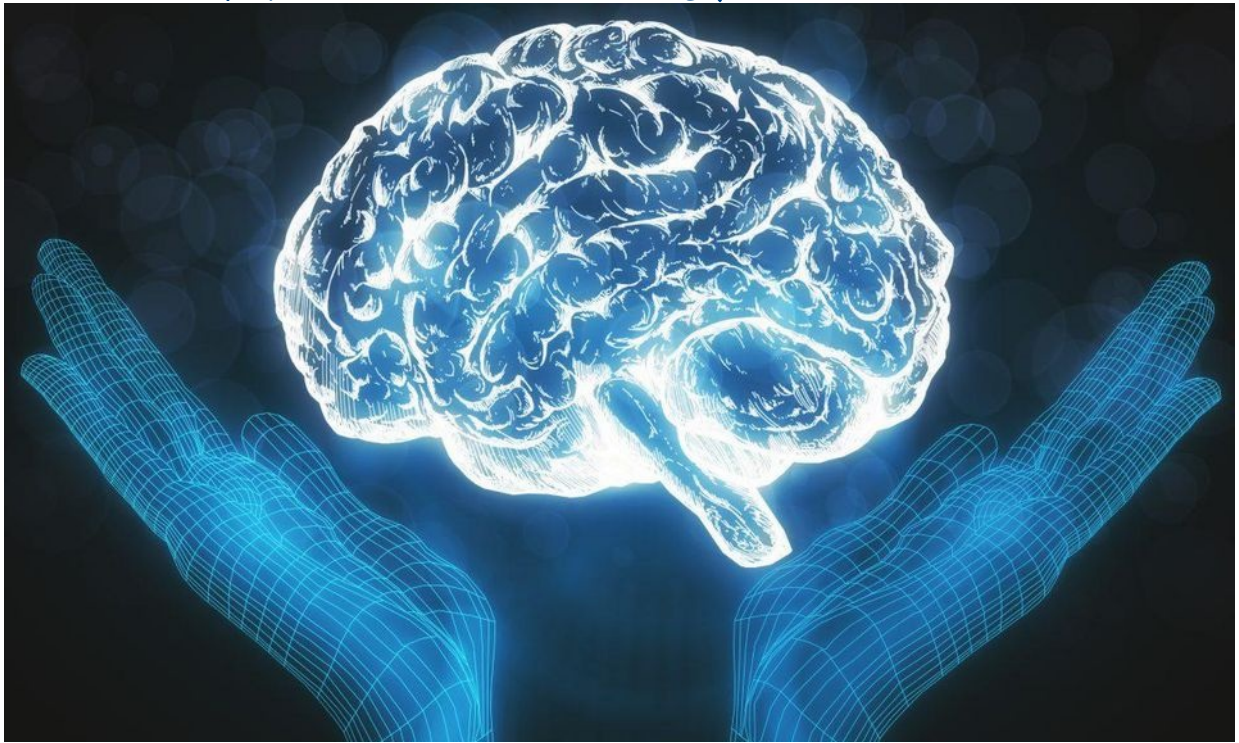
5:1 ... use patterns and mental math to divide.

$$8 \div 4 = ?$$

$$4^{\,\cdot 2}\overline{\smash{)}8}{}^{\textstyle 2} = 2$$

The symbol for division is a fraction. $\div$

Division is the same as simplifying improper fractions.

$$4\overline{\smash{)}8}{}^{\textstyle 2} \quad = \quad \frac{8}{4} = 2$$

Terms

Fractions = $\dfrac{\text{numerator}}{\text{denominator}}$ = simplified

$$\frac{8}{4} = 2$$

Division = $\text{divisor}\overline{\smash{)}\text{dividend}}{}^{\textstyle \text{quotient}} = 4\overline{\smash{)}8}{}^{\textstyle 2}$

If you cut an 8 inch carrot into 4 even pieces how long is each piece?

$$\frac{8}{4} = 4\overline{)8} =$$
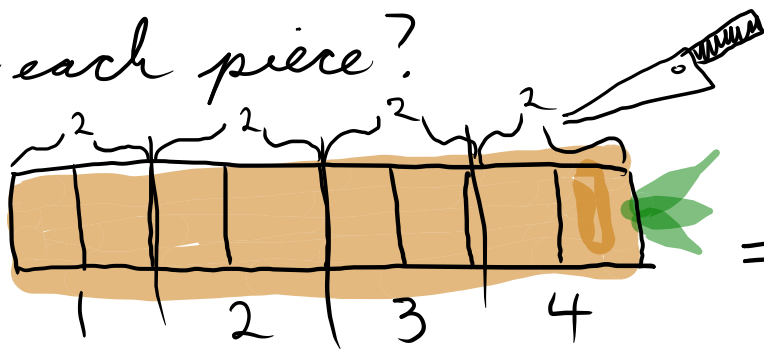
$= $ ②inch slices!

If you cut an 80 inch carrot into 40 even pieces. How long is each piece?

$$\frac{80}{40} = 40\overline{)80}^{\,2} = $$ ②inch slices.

Pattern?

$$\frac{0.08}{0.04} = \frac{0.8}{0.4} = \frac{8^{\times 10}}{4^{\times 10}} = \frac{80^{\times 10}}{40^{\times 10}} = \frac{800^{\times 10}}{400^{\times 10}} = \frac{8,000}{4,000} = 2$$

$$8,000 \div 4,000 \qquad 8,000 \div 4,000 = 8 \div 4$$

$$100 \div 0.5 = \frac{100^{\times 10}}{0.5^{\times 10}} = \frac{1000}{0.5} = \frac{1,000}{5}$$

$$5\overline{)1000}^{\,200}$$
$$\underline{1\,0}$$
$$000$$

$$100 \div 0.5 = 200$$

Name _____

☆ **Solve & Share** ☆

A bakery sells muffins to local grocery stores in boxes that hold 20 muffins each. How many boxes are used if 60 muffins are sold? 600 muffins? 6,000 muffins? *Solve this problem any way you choose.*

I can ...
use patterns to find quotients.

© Content Standard 5.NBT.B.6
Mathematical Practices MP.2, MP.3, MP.6, MP.7, MP.8

Find the answer for 60 muffins. Then you can look for relationships to help find the answers for 600 and 6,000 muffins. *Show your work!*

Number of Muffins Sold	Number of Muffins per Box	Number of Boxes
60	20	3
600	20	30
6,000	20	300

$$60 \div 20 = ?$$

$$\frac{60}{20} = \frac{6}{2}$$

$$2\overline{)6}^{\,3}$$

$$\begin{array}{r} 300 \\ \underline{\times\ 20} \\ 000 \\ \underline{600\ } \\ 6{,}000 \end{array}$$
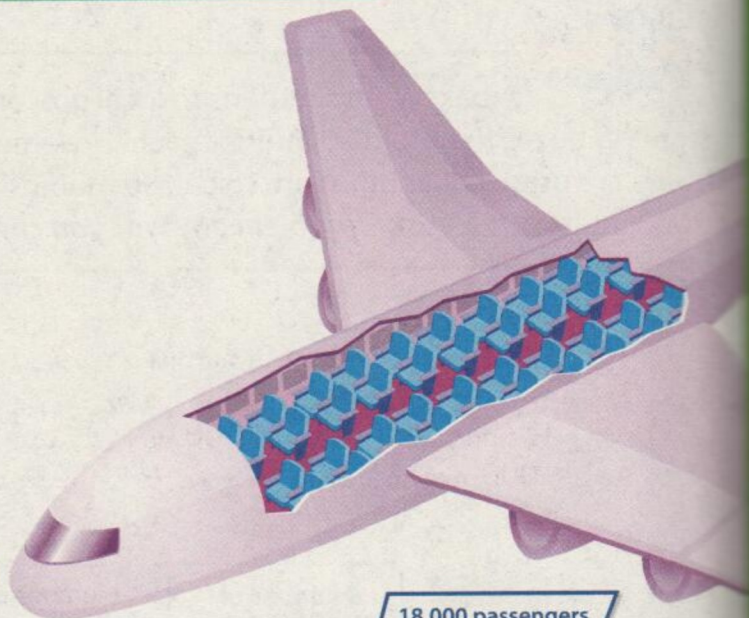
Look Back! © **MP.8 Generalize** How can you use multiplication to help you divide 6,000 by 20?

ion, Inc. 5

Essential Question: How Can Patterns Help You Divide Multiples of 10?

A

A jet carries 18,000 passengers in 90 trips. The plane is full for each trip. How many passengers does the plane hold?

Find 18,000 ÷ 90, the number of passengers on each trip.

18,000 passengers in 90 trips

B

Think of a basic fact to help you.

$18 \div 9 = 2$

Think about multiples of 10:

$180 \div 90 = 18 \text{ tens} \div 9 \text{ tens} = 2$

$1,800 \div 90 = 180 \text{ tens} \div 9 \text{ tens} = 20$

$18,000 \div 90 = 1,800 \text{ tens} \div 9 \text{ tens} = 200$

C

The pattern shows that $18,000 \div 90 = 200$.

So, the jet can hold 200 passengers during each trip.

$200 \times 90 = 18,000$

Multiply to check your answer.

Convince Me! © MP.7 Look for Patterns If the jet above carried 10,000 people in 50 trips, how many people did it carry each trip? The jet carried the same number of people each trip.

What basic fact helped you find the answer?

1. the

2. A je
40
ho
it c

Indepe

Leveled

10. 560

12. 6,00

14. 2,00

17. 21,0

20. 56,0

23. 42,0

Guided Practice*

Do You Understand?

1. **© MP.8 Generalize** Why is 210 ÷ 30 the same as 21 tens ÷ 3 tens?

2. A jet carried 12,000 people in 40 trips. If the jet was full each trip, how many people did it carry for each trip?

Use a basic fact to help you.

Do You Know How?

In **3–9**, find each quotient. Use mental math.

3. $210 \div 30 = 21$ tens ÷ 3 tens = ____

4. $480 \div 60 = 48$ tens ÷ 6 tens = ____

5. $15{,}000 \div 30 = 1{,}500$ tens ÷ 3 tens = ____

6. $8{,}100 \div 90 =$ **90**   7. $2{,}800 \div 70 =$ ____

$$9\overline{\smash{)}81}$$

8. $30{,}000 \div 50 =$ **600**   9. $1{,}800 \div 60 =$ ____

$$5\overline{\smash{)}30}$$

Independent Practice*

Leveled Practice In **10–25**, use mental math to find the missing numbers.

10. $560 \div 70 = 56$ tens ÷ 7 tens = ____

11. $360 \div 60 = 36$ tens ÷ 6 tens = ____

12. $6{,}000 \div 50 = 600$ tens ÷ 5 tens = ____

13. $24{,}000 \div 60 = 2{,}400$ tens ÷ 6 tens = ____

14. $2{,}000 \div 20 =$ ____

15. $6{,}300 \div 90 =$ ____

16. ____ $\div 10 = 24$

17. $21{,}000 \div$ ____ $= 700$

18. $2{,}500 \div 50 =$ ____

19. $72{,}000 \div$ ____ $= 800$

20. $56{,}000 \div$ ____ $= 800$

21. ____ $\div 10 = 100$

22. $45{,}000 \div 90 =$ ____

23. $42{,}000 \div 70 =$ ____

24. $64{,}000 \div$ ____ $= 800$

25. $32{,}000 \div$ ____ $= 400$

26. The table shows the number of passengers who flew on airplane flights in or out of one airport. Each flight had the same number of passengers. How many passengers were on each flight?

DATA		
Total passengers	:	27,000
Number of flights	:	90
Crew members	:	900

27. **Algebra** A truck delivers 478 dozen eggs to stores in one day. Write and solve an equation to find n, the number of eggs the truck delivers in one day.

28. Paula wants to divide 480 tomatoes equally among 80 baskets. How many tomatoes will Paula put in each basket?

29. © **MP.6 Be Precise** Ernesto measured the width of each of the three coins shown below.

| 0.7 inch | 0.84 inch | 0.74 inch |
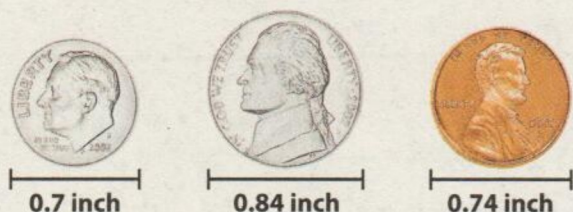
What is the difference in width between the widest coin and the least wide coin?

30. **Higher Order Thinking** A baker uses 30 grams of sea salt for each batch of bread. Sea salt comes in an 18-kilogram package or an 800-gram package. Which size package should the baker buy so that no sea salt is left after all of the batches are made? Explain.

1 kilogram equals 1,000 grams

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31. Which is 2,400 divided by 80?

Ⓐ 3
Ⓑ 4
Ⓒ 30
Ⓓ 40

32. Which expression has a quotient of 70?

Ⓐ 420 ÷ 60
Ⓑ 4,200 ÷ 6
Ⓒ 4,200 ÷ 60
Ⓓ 4,200 ÷ 600

Another Look!

A school spends $12,000 on 20 new computers.
Each computer costs the same amount.
How much does each computer cost?

Find a basic fact and then use patterns.

A basic fact that can be used for 12,000 ÷ 20 is
12 ÷ 2 = 6.

$120 \div 20 = 6$
$1{,}200 \div 20 = 60$
$12{,}000 \div 20 = 600$

Multiply to check: $600 \times 20 = 12{,}000$

Each computer costs $600.

> Use place-value patterns to help find the quotient.

Leveled Practice In **1–16**, use a basic fact and a pattern to help solve.

1. 720 ÷ 90 = 72 tens ÷ 9 tens = __8__
   72 ÷ 9 = 8

2. 4,800 ÷ 60 = 480 tens ÷ 6 tens = ____

3. 1,200 ÷ 30 = ____ tens ÷ ____ tens = ____

4. 25,000 ÷ 50 = ____ tens ÷ ____ tens = ____

5. 320 ÷ 40 = 8

6. 9,000 ÷ 30

7. 1,800 ÷ 90

8. 2,000 ÷ 40 = 50

9. 24,000 ÷ 80

10. 32,000 ÷ 40

11. 3,600 ÷ 90 = 40

12. 40,000 ÷ 50

13. 42,000 ÷ 60

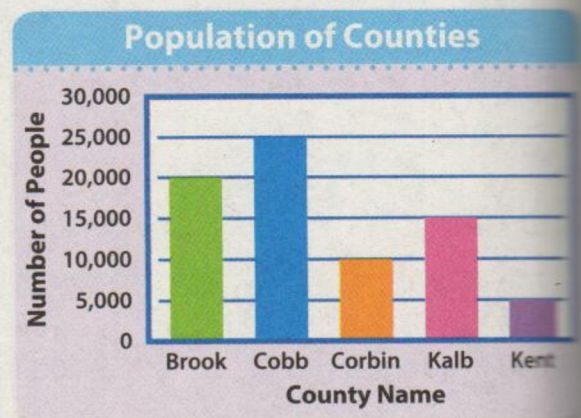14. 5,400 ÷ 60 = 90

15. 49,000 ÷ 70

16. 56,000 ÷ 80

17. ⓒ **MP.7 Use Structure** A carton of staples has 50 packages. The carton contains 25,000 staples in all. Each package has an equal number of staples. How many staples are in each package? Explain how to use a basic fact to find the answer.

18. ⓒ **MP.2 Reasoning** A club collected $3,472 to buy computers. If each computer costs $680, estimate the number of computers that the club can buy. Explain.

19. Higher Order Thinking A railroad car container can hold 42,000 pounds. Mr. Evans wants to ship 90 ovens and some freezers in the same container. If each freezer weighs 600 pounds, how many freezers could be shipped in the container? Explain.

Each oven weighs 200 pounds

20. ⓒ **MP.3 Critique Reasoning** There are 50 communities in Kalb County. Each community has about the same number of people. Marty estimates there are about 300 people living in each community. Is his estimate reasonable? Justify your answer.

Population of Counties

Bar chart: Number of People vs. County Name (Brook, Cobb, Corbin, Kalb, Kent). Y-axis from 0 to 30,000 in increments of 5,000.

ⓒ **Common Core Assessment**

21. Which is 2,000 divided by 50?

ⓐ 4

ⓑ 40

ⓒ 400

ⓓ 4,000

22. Which expression has a quotient of 400?

ⓐ 800 ÷ 20

ⓑ 8,000 ÷ 2

ⓒ 8,000 ÷ 20

ⓓ 80,000 ÷ 20

5:2 ... estimate quotients.

5:2 ... _estimate_ quotients with 2 digit divisors.

$$\text{divisor } \overline{\smash{)}\text{dividend}}^{\text{quotient}}$$

$147 \div 13 = ?$

$$13\overline{\smash{)}147}^{\,?}$$

$147 \div 13 = ?$
$\downarrow$
$150 \div 15 = 10$

$159 \div 75$
$\downarrow \qquad \downarrow$
$160 \div 80 = 2$

$412 \div 84 = ?$
$\downarrow \qquad \downarrow$
$400 \div 80 = 5$

$815 \div 23 = ?$
$\downarrow$
$800 \div 20 = 40$
$800 \div 25 = 32$

$540 \div 61 =$
$\downarrow \qquad \downarrow$
$540 \div 60 = 9$

Solve

Lesson 5-2
Estimate Quotients with 2-Digit Divisors

Solve & Share

Kyle's school needs to buy posters for a fundraiser. The school has a budget of $147. Each poster costs $13. About how many posters can his school buy? *Solve this problem any way you choose.*

I can ...
estimate quotients.

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Mathematical Practices MP.1, MP.2, MP.3, MP.4

You can use reasoning to find compatible numbers to estimate quotients. *Show your work!*

Look Back! © **MP.1 Make Sense and Persevere** What numbers are close to 147 and 13 that would be easy to divide using mental math?

How Can You Use Compatible Numbers to Estimate Quotients?

A

Betty earned $159 by selling 75 bracelets. Each bracelet was the same price. About how much did each bracelet cost?

$159 for 75 bracelets

You can use division to find the price.

You know the total amount earned and the number of bracelets.

B The question asks, "About how much?" So, an estimate is enough.

Use compatible numbers to estimate 159 ÷ 75.

160 and 80 are close to 159 and 75, and 80 divides 160 evenly.

So, 160 and 80 are compatible numbers.

16 can be divided evenly by 8.

C Since 160 ÷ 80 = 2, 159 ÷ 75 is about 2.

Betty charged *about* $2 for each bracelet.

Use multiplication to check for reasonableness.

2 × 80 = 160.

Convince Me! © **MP.1 Make Sense and Persevere** Suppose Betty earned $230 selling the 75 bracelets. Estimate the cost of each bracelet. What compatible numbers did you use?

Practice
Buddy   Tools   Assessment

Guided Practice

Do You Understand?

1. **MP.3 Critique Reasoning** Betty has 425 more bracelets to sell. She wants to store these in bags that hold 20 bracelets each. She estimates she will need about 25 bags. Do you agree? Why or why not?

Do You Know How?

In **2–7**, estimate using compatible numbers.

2. $287 \div 42$

3. $320 \div 11$

4. $208 \div 72$

5. $554 \div 62$

6. $815 \div 23$

7. $2,491 \div 48$

Independent Practice

Leveled Practice In **8–10**, fill in the blanks to find each estimate.

8. $412 \div 84$
   $400 \div \square = \square$

9. $288 \div 37$
   $280 \div \square = \square$

10. $2,964 \div 73$
    $2,800 \div \square = \square$

In **11–22**, estimate using compatible numbers.

11. $228 \div 19$

12. $1,784 \div 64$

13. $7,260 \div 83$

14. $2,280 \div 12$

15. $485 \div 92$

16. $540 \div 61$

17. $1,710 \div 32$

18. $2,740 \div 67$

19. $4,322 \div 81$

20. $5,700 \div 58$

21. $7,810 \div 44$

22. $6,395 \div 84$

Math Practices and Problem Solving

23. © **MP.4 Model with Math** The sign shows the price of baseball caps for different pack sizes. Coach Lewis will buy the medium-size pack of caps. About how much will each cap cost? Write an equation to model your work.

Packs of Baseball Caps

20 Small Caps   32 Medium Caps   50 Large Caps
$180.00 $270.00 $360.00

24. © **MP.1 Make Sense and Persevere** There are 91 days until the craft sale. Autumn needs to make 817 rings before the sale. She wants to make about the same number of rings each day. About how many rings should she make each day? Explain how Autumn can use compatible numbers to estimate.

25. **Higher Order Thinking** A company purchased 3,128 bottles of water. Each department needs 55 bottles. Which compatible numbers provide a better estimate for the number of departments that can get the bottles needed — $3,000 \div 60$ or $3,000 \div 50$? Explain. Then make the estimate.

26. © **MP.4 Model with Math** Rita had $20. Then she saved $5.85 each week for 8 weeks. How much money does she have now? Use the bar diagram to solve the problem. Show your work.

? total savings

8 weeks → | 5.85 | | | | | | | |

$ saved each week
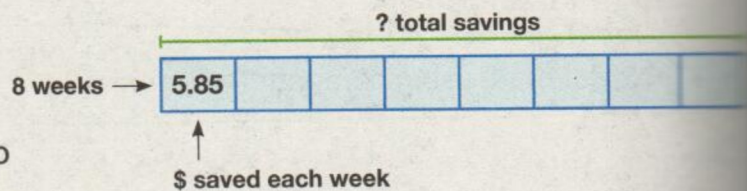
© Common Core Assessment

27. Lea bought 225 flowers and 12 vases. She put about the same number of flowers in each vase. Which is the best estimate for the number of flowers in each vase?

- Ⓐ 40 flowers
- Ⓑ 30 flowers
- Ⓒ 20 flowers
- Ⓓ 10 flowers

28. A school has 617 students. Each class has between 28 and 32 students. Which is the best estimate of the number of classes in the school?

- Ⓐ 14 classes
- Ⓑ 20 classes
- Ⓒ 30 classes
- Ⓓ 60 classes

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Name _____

Another Look!

Frog Trail is 1,976 meters long. Shondra walks 43 meters of the trail each minute. **About** how many minutes will it take Shondra to walk the trail?

Find compatible numbers. Think of a basic fact. Then use place-value patterns.

(handwritten: round compatible)

$1,976 \div 43$
↓   ↓
$2,000 \div 40 = 50$

$2,000 \div 40 = 50$, so
$1,976 \div 43$ is about 50.

It would take Shondra about 50 minutes.

> You can use a basic fact and place-value patterns.

Leveled Practice In **1–3**, fill in the blanks to find the estimates.

1. $1,769 \div 23$ *(handwritten: 9×2=18, 90×2=180)*
   ↓   ↓
   $1,800 \div 20 = 90$ *(handwritten: 90×20=1800)*

2. $516 \div 48$
   ↓   ↓
   $500 \div \square = \square$

3. $891 \div 32$
   ↓   ↓
   $\square \div \square = \square$

In **4–15**, estimate using compatible numbers.

4. $231 \div 34$
   (handwritten: $240 \div 30 = 8$)

5. $705 \div 11$

6. 8

7. $5,624 \div 72$
   (handwritten: $5,600 \div 70 = 80$)

8. $1,043 \div 23$

9. 9

10. $642 \div 94$
    (handwritten: $630 \div 90 = 7$)

11. $4,870 \div 58$

12. 5

13. $148 \div 51$
    (handwritten: $150 \div 50 = 3$)

14. $9,073 \div 11$

15. $3,514 \div 58$

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

16. **© MP.3 Critique Reasoning** Meredith says "Since 1 times 1 equals 1, then 0.1 times 0.1 equals 0.1." Do you agree? Explain your reasoning.

17. **Math and Science** A gray whale traveled 152 kilometers in one day. The whale swam between 7 and 8 kilometers each hour. About how many hours did it take the whale to swim the distance? Show two different ways that you can use compatible numbers to find an answer. Then solve.

18. **© MP.3 Construct Arguments** Meg wants to find about how many phones the company activated in one minute. Explain why Meg can use $15,000 \div 50$ to find the answer.

DATA

Clear Connect Company

phones activated: 14,270 in 50 minutes

calls made: 59,835

text messages sent: 2,063

19. **Higher Order Thinking** Ester's choir wants to learn a new song for the school concert in 7 weeks. The song has 3,016 lines. The choir learns an equal number of lines each day. About how many lines do they need to learn each day to learn the song in time for the concert? Explain.

New song ⟶ | 3,016 lines

? | 50 days

↑
? lines each day

7 weeks is about 50 days.
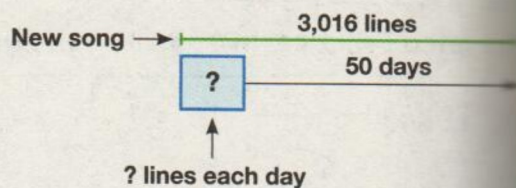
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20. Mr. Crane's farm is 593 acres. He divides the farm into 32 equal parts. Which is the best estimate of the number of acres in each part?

   Ⓐ 10 acres

   Ⓑ 20 acres

   Ⓒ 100 acres

   Ⓓ 200 acres

21. A scientist counted 3,921 total eggs in 49 sea turtle nests. Each nest had about the same number of eggs. Which is the best estimate of the number of eggs she counted in each nest?

   Ⓐ 800 eggs

   Ⓑ 100 eggs

   Ⓒ 80 eggs

   Ⓓ 10 eggs

5:3 ...use models to help find quotients.
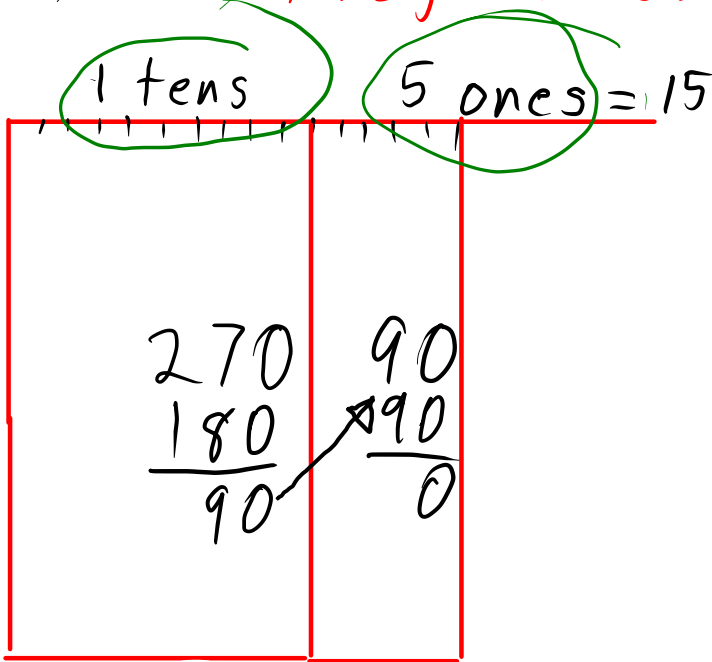
5:3 ... use models to divide with 2 digit divisors.

$$52 \quad\quad 63$$

$$50 + 2 = 52 \quad\quad 60 + 3 = 63$$

$$\text{divisor} \overline{)\text{dividend}}^{\text{quotient}}$$

height × Length = area

width × height = area

(1 tens)   (5 ones) = 15

? × 18 = 270

$$18$$

$$\begin{array}{r} 270 \\ 180 \\ \hline 90 \end{array} \quad \begin{array}{r} 90 \\ 90 \\ \hline 0 \end{array}$$

$$22$$
$$30\overline{)660}$$

$$30 \leftarrow$$
$$\times 22$$
$$660 \leftarrow$$

10

$$\times 15$$
$$18\overline{)270}$$
$$18 \downarrow$$
$$90$$
$$90$$
$$\overline{0}$$

$$4$$
$$18$$
$$5$$
$$\overline{90}$$

$$375 \div 25$$

$$25\overline{)}$$

5:3 ... use models to divide with 2 digit divisors.

$$\overset{\text{quotient}}{\text{divisor}\,\overline{)\,\text{dividend}}}$$

52
50 + 2 = 52

63
60 + 3 = 63

$608 \div 19 = ?$

1 19
2 38
3 57
4 76

3 tens   ? ones ?
                                           2 ones

19 | $\begin{array}{r} 5, \\ \cancel{6}08 \\ -570 \\ \hline 38 \end{array}$ 38

30   2
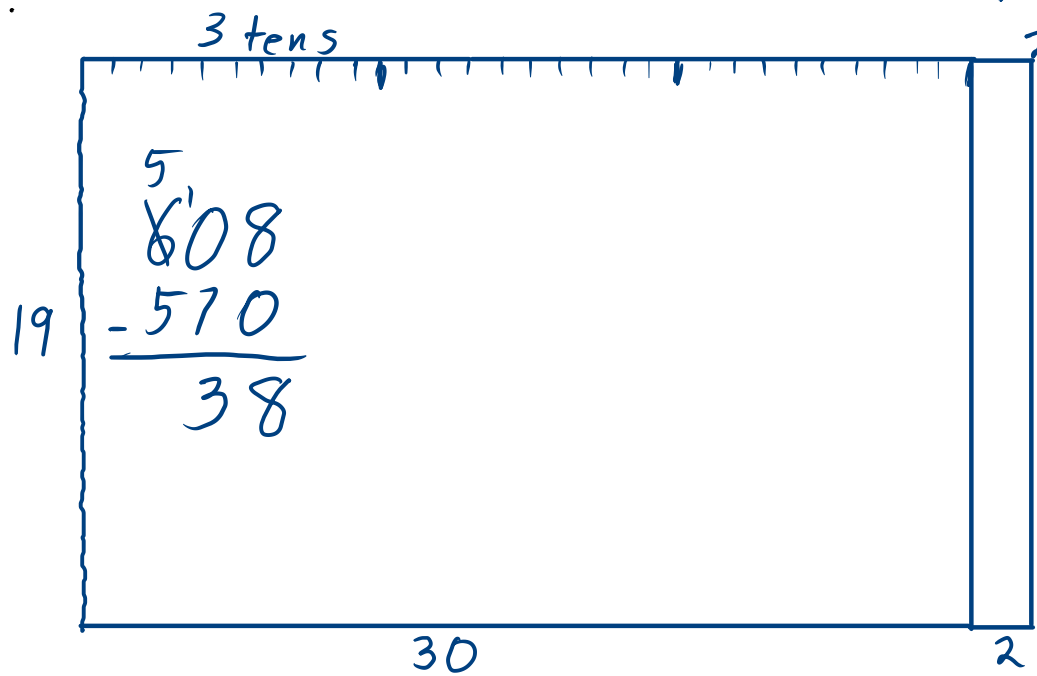
$608 \div 19 = 32$

Name _____

☆ ☆
Solve & Share

A parking lot has 270 parking spaces. Each row has 18 parking spaces. How many rows are in this parking lot? *Solve this problem any way you choose.*
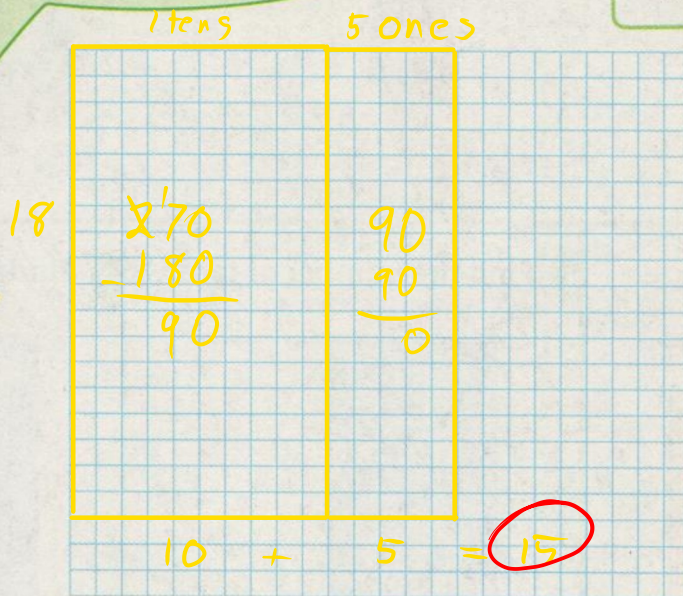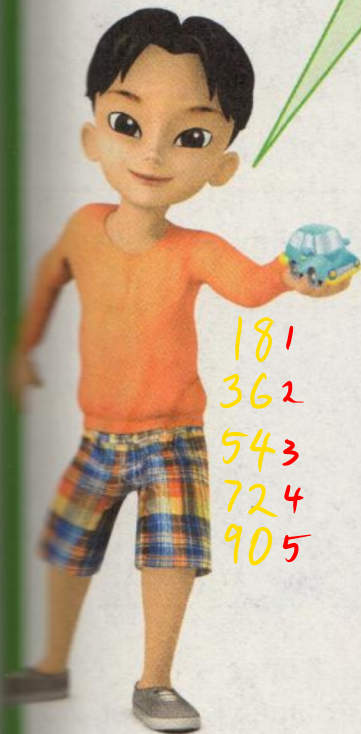
I can ...
use models to help find quotients.

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Mathematical Practices MP.1, MP.2, MP.4, MP.5, MP.6

You can use appropriate tools, such as grid paper, to solve the problem. *Show your work!*

1 tens 5 ones

18

$270 \div 18 = ?$
$270 \div 18 = 15$

2 70
- 1 80
90

90
90
0

18 1
36 2
54 3
72 4
90 5

10 + 5 = 15

Look Back! © **MP.1 Make Sense and Persevere** How can you use estimation to check that your answer to the problem above is reasonable?

Essential Question

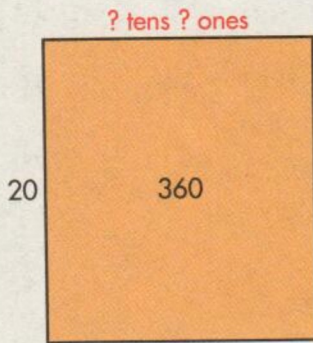# How Can You Use Area Models to Find Quotients?

A

Emily has a rectangular garden with an area of 360 square feet. The length of her garden measures 20 feet. How many feet wide is her garden?

You can have *w* stand for the unknown side.

Think: $20 \times w = 360$
or $360 \div 20 = w$.

w

20 ft   360 sq. ft.

B Find the unknown side length.

? tens ? ones

20	360

C Find the number of tens.

10   ?

20	360 −200 160	

D Find the number of ones.

1 ten + 8 ones = 18

20	360 −200 160	160 −160 0

1 ten + 8 ones = 18.
So, the garden is 18 feet wide.
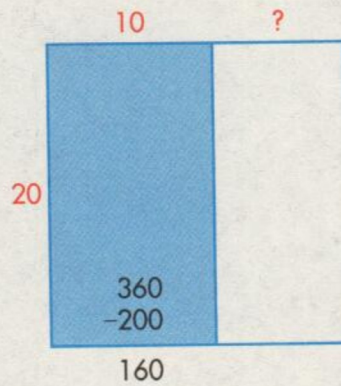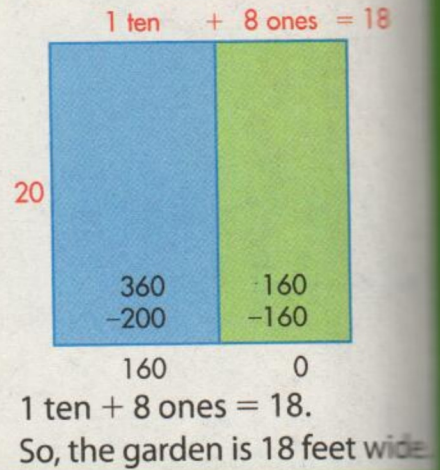
Convince Me! © **MP.1 Make Sense and Persevere** Use the model to find the quotient $408 \div 12$. Hint: Find the value of *x* and solve.
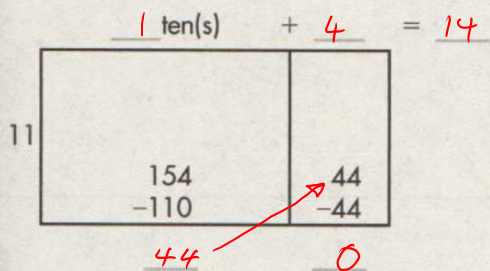
3 tens   *x*

12	408 − 360 48	48

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Name

Gui

Do Y

1.

2.

☆
Indep

Levele

6. Use

So,

7. 342

10. 752

For anoth

Name _____
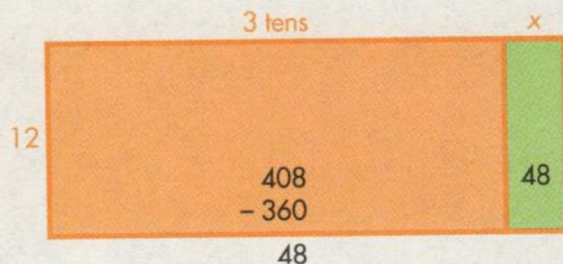
☆ Guided Practice*

Do You Understand?

1. Write the missing numbers to find 154 ÷ 11.

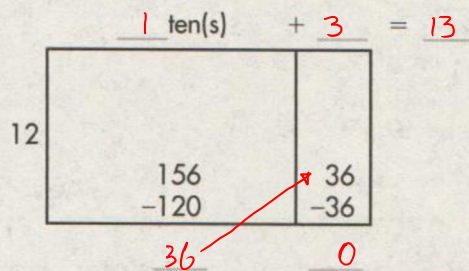___1___ ten(s)   + _4_ = _14_

11

| 154 | 44 |
| −110 | −44 |

_44_ →   _0_

So, 154 ÷ 11 = ___

2. © **MP.1 Make Sense and Persevere**
Write a multiplication equation and a division equation that represent the model shown below. Then solve.

? tens ? ones

32

672
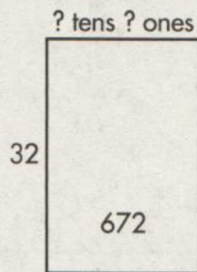
Do You Know How?

3. Use the model to find 156 ÷ 12.

___1___ ten(s)   + _3_ = _13_

12

| 156 | 36 |
| −120 | −36 |

_36_ →   _0_

So, 156 ÷ 12 = ___

In **4** and **5**, use grid paper or draw a picture to find each quotient.

4. 682 ÷ 22   5. 143 ÷ 11
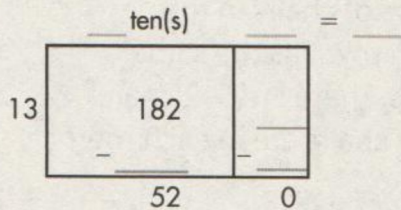
Start by estimating how many tens will be in the quotient.

☆ Independent Practice ☆

Leveled Practice In **6–12**, use grid paper or draw a picture to find each quotient.

6. Use the model to find 182 ÷ 13.

So, 182 ÷ 13 = ___.

___ ten(s)   _____   = _____

13

182	
− _____	− _____
52	0

7. 342 ÷ 38   8. 720 ÷ 16   9. 608 ÷ 19
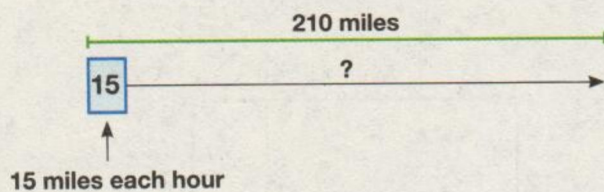
10. 752 ÷ 47   11. 375 ÷ 25   12. 576 ÷ 24

Math Practices and Problem Solving

13. **MP.4 Model with Math** Angelo is training for a long-distance bicycle ride. He travels 15 miles each hour. How many hours will it take him to ride 210 miles?

```
         210 miles
|----------------------------|
[15]          ?
 |--------------------------->
 ↑
15 miles each hour
```

14. **Higher Order Thinking** A rectangular doormat is 21 inches long and has an area of 714 square inches. Find its width. Will the doormat fit in an entryway that is 36 inches wide? Show your work.

15. **MP.6 Be Precise** Use the map. How much longer is the distance from the library to the park to the train station than the distance from the library straight to the train station?

Library   3.82 mi   Train Station

2.14 mi   2.96 mi
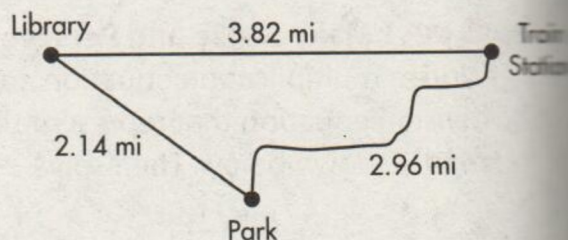
Park

16. **Algebra** If you walk from the train station to the library, then to the park, and then back to the train station, how many miles would you walk in all? Write an equation to model your work.

17. **MP.1 Make Sense and Persevere** Explain how you can use the picture to show that $391 \div 23 = 17$.

```
              1 ten        7 ones
      23   |  391    |   161   |
           |  -230   |  -161   |
```

Common Core Assessment

18. There are 16 rows of chairs in the auditorium. Each row has the same number of chairs. There are 512 chairs in all. How many chairs are in each row?

   Ⓐ 22 chairs
   Ⓑ 30 chairs
   Ⓒ 32 chairs
   Ⓓ 33 chairs

19. A patio has an area of 286 square feet. If the length of the patio is 22 feet, what is the width?

   Ⓐ 10 feet
   Ⓑ 13 feet
   Ⓒ 14 feet
   Ⓓ 144 feet

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Help Practice Buddy Tools Games
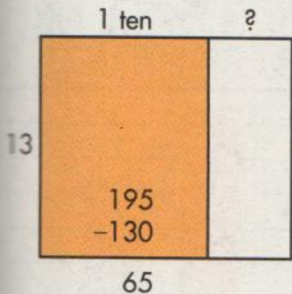
Another Look!

Hal's store just got a shipment of 195 cans of soup. Hal wants to divide the cans equally on 13 shelves. How many cans should he put on each shelf?

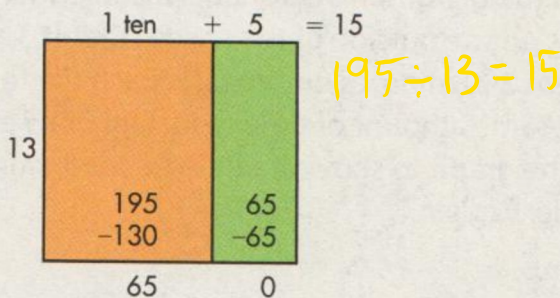*Are there enough cans for 1 ten in each group? for 2 tens in each group?*

Step 1

Divide the tens. Record.

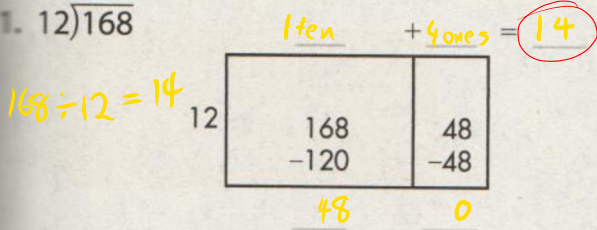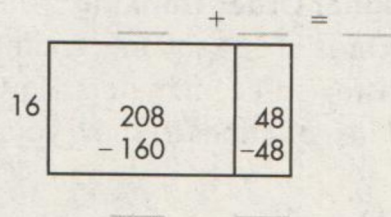1 ten   ?

13

195
−130

65

Step 2

Divide the ones. Record.

1 ten + 5 = 15

13

195   65
−130   −65

65   0

$195 \div 13 = 15$

He should put 15 cans on each shelf.

In **1** and **2**, use the model to find each quotient.

1. 12)168

1 ten + 4 ones = (14)

$168 \div 12 = 14$

12 | 168   48
   | −120 −48
       48   0

2. 16)208

___ + ___ = ___

16 | 208   48
   | −160 −48

In **3–8**, use grid paper or draw a picture to find each quotient.

3. 420 ÷ 14 = (30)
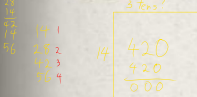
4. 385 ÷ 11

5. 744 ÷ 24

6. 675 ÷ 27 = (25)
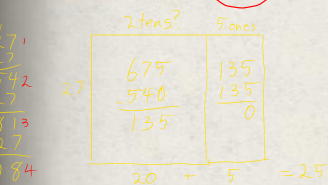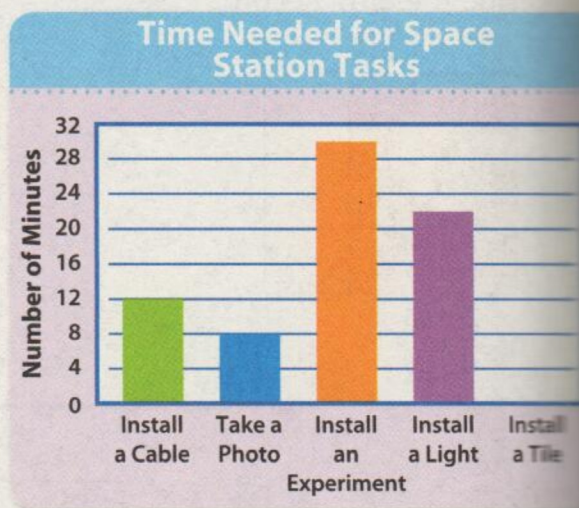
7. 558 ÷ 18

8. 228 ÷ 19

9. **© MP.2 Reasoning** Anna has 10^2 quarters. Jazmin has 10^2 dimes. Who has more money, Anna or Jazmin? How much more? Explain your reasoning.

10. **© MP.1 Make Sense and Persevere** A 208-yard-long road is divided into 16 parts of equal length. Mr. Ward paints a 4-yard-long strip in each part. How long is the unpainted strip of each part of the road?

What steps do you need to solve to find the answer?

11. Use the bar graph. Astronauts installed 15 new tiles on the outside of the space station. They spent 390 minutes on the task. Each tile took the same amount of time to install. Draw a bar in the graph to show the time needed to install a tile. Explain.

12. How much longer does an astronaut take to install a light than to install a cable?

Time Needed for Space Station Tasks

Number of Minutes
32
28
24
20
16
12
8
4
0

Install a Cable — Take a Photo — Install an Experiment — Install a Light — Install a Tile

13. **Higher Order Thinking** A rectangular poster has an area of 504 square centimeters. The width of the poster is 14 centimeters. How long is the poster? Write equations to show your work.

? tens   ?

14
504
−420
84
−84
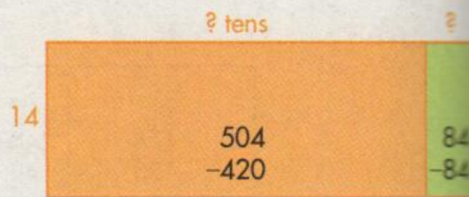
© Common Core Assessment

14. Which is 540 divided by 30?

Ⓐ 17

Ⓑ 18

Ⓒ 170

Ⓓ 180

15. Which is 391 divided by 17?

Ⓐ 23

Ⓑ 24

Ⓒ 230

Ⓓ 240

5:4 Find quotients of whole numbers.

5:4 ... use partial quotients to divide.

$731 \div 43 = 17$

1 tens	7 ones
731	301
430	301
301	0

43

1
43
6
258

2
43
7
301

$$7 \leftarrow$$
$$10 \leftarrow = 17$$
$$43\overline{)731}$$
$$-430$$
$$\overline{301}$$
$$-301$$
$$\overline{0}$$

$660 \div 30 = 22$

2
20 ← 22
$$30\overline{)660}$$
$$-600$$
$$\overline{060}$$
$$-60$$
$$\overline{000}$$

Solve & Share

A hotel sets up tables for a conference for 156 people. If each table seats 12 people, how many tables will be needed? *Solve this problem any way you choose.*

I can ...
find quotients of whole numbers.

Ⓒ **Content Standard** 5.NBT.B.6
Mathematical Practices MP.1, MP.2, MP.3, MP.4, MP.6, MP.8

You can use estimation and reasoning to help solve this problem. Think about how many groups of 12 you can take away from 156. *Show your work!*
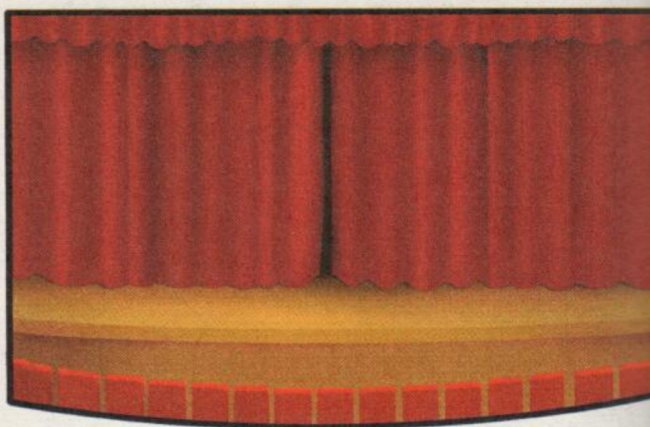
Look Back! Ⓒ **MP.8 Generalize** How can you check that the answer to a division problem is correct?

Essential Question

How Can You Use Partial Quotients to Solve Division Problems?

A

A theater has 375 seats arranged in rows with 15 seats in each row. How many rows are in this theater? Let r equal the number of rows. Think: $15 \times r = 375$ or $375 \div 15 = r$.

The area model can help you see the steps in dividing.

B

2 tens   5 ones

15

375   75
− 300   − 75
75   0

5
20
$15\overline{)375}$ Estimate: How many 15s in 375? Try 20.
− 300 Multiply 20 by 15 and subtract.
75 Estimate: How many 15s in 75? Try 5.
− 75 Multiply 5 by 15 and subtract.
0 Stop when the difference is 0.

Add the partial quotients: $20 + 5 = 25$.

$375 \div 15 = 25$

So, there are 25 rows in the theater.

Convince Me! © **MP.3 Critique Reasoning** Dinah's solution to the problem above is shown at the right. Is her solution correct? Explain.

```
        5
       10
       10
  15)375
    −150
     225
    −150
      75
     −75
       0
```

For another

Gui

Do Y

1.

2. H

☆
Indep

Levele

7. $19\overline{)2}$

−1

Add

9. $11\overline{)13}$

13. $23\overline{)71}$

☆ Guided Practice

Do You Understand?

1. Show one way of using partial quotients to find 231 ÷ 11.

2. How can you use estimation to check that your answer to Problem 1 is reasonable?

Do You Know How?

In **3–6**, use partial quotients to divide. Show your work.

3.   4←
     10← =14
   15)210
     150
      60
      60
       0

4.   2← =22
     20←
   13)286
     260
      26
      26
       0

5. 25)575

6. 32)960

☆ Independent Practice ☆

Leveled Practice In **7–16**, use partial quotients to divide. Show your work.

7. 19)247

   −190   Multiply ___ by 19.
    57

   −57   Multiply ___ by 19.
     0

   Add the partial quotients:
   ___ + ___ = ___

8. 14)630

   −560   Multiply ___ by 14.
    70

   −70   Multiply ___ by 14.
     0

   Add the partial quotients:
   ___ + ___ = ___

9. 11)132

10. 21)840

11. 16)304

12. 32)480

13. 23)713

14. 30)660

15. 43)731

16. 16)608

Math Practices and Problem Solving

17. A 969-acre wildlife preserve has 19 cheetahs. About how many acres does each cheetah have to itself, if each cheetah roams the same number of acres?

18. © **MP.6 Be Precise** A factory produces 272 chairs in an 8-hour shift. If the factory produces the same number of chairs each hour, how many chairs does it produce in 30 minutes?

19. A cafeteria can seat 5×10^2 students. Each table has 2×10^1 seats. How many tables are in the cafeteria?

20. © **MP.4 Model with Math** Peter is driving 992 miles from Chicago to Dallas. His sister Anna is driving 1,068 miles from Phoenix to Dallas. Write and solve an equation to find how much farther Anna drives than Peter drives.

21. © **MP.1 Make Sense and Persevere** Write a multiplication equation and a division equation that represent the model shown below.
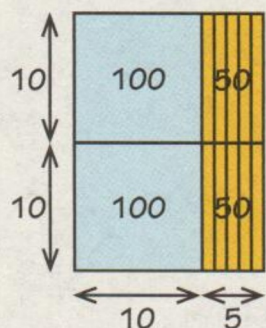
22. Higher Order Thinking How can you use partial quotients to find $325 \div 13$? Explain.

© **Common Core Assessment**

23. Which expressions are equivalent to 35?

- [ ] $1,400 \div 4$
- [ ] $420 \div 12$
- [ ] $875 \div 25$
- [ ] $7,700 \div 22$
- [ ] $14,000 \div 40$

24. Which expressions are equivalent to 22?

- [ ] $704 \div 32$
- [ ] $1,078 \div 49$
- [ ] $1,890 \div 30$
- [ ] $1,430 \div 65$
- [ ] $4,500 \div 50$

Another Look!

A baker made 312 bagels in one day. If he puts 12 bagels in each package, how many packages did he make that day?

```
      6
     20
12)312    Try 20.
  −240    Multiply 20 by 12 and subtract.
    72    Try 6.
  − 72    Multiply 6 by 12 and subtract.
     0    Stop when the difference is 0.
```

Add the partial quotients: $20 + 6 = 26$.

So, the baker made 26 packages of bagels.

> You can use multiplication to check your answer.

Leveled Practice 1–13, use partial quotients to divide. Show your work.

1. $21\overline{)714}$ Try ___.
     − ☐☐☐   Multiply ___ by 21 and subtract.
     ☐☐☐   Try ___.
     − ☐☐☐   Multiply ___ by 21 and subtract.
         0

So, $714 \div 21 =$ ___

2. $41\overline{)533}$

3. $15\overline{)330}$

4. $39\overline{)780}$

5. $50\overline{)700}$

6. $11\overline{)792}$

7. $24\overline{)648}$

8. $33\overline{)396}$

9. $17\overline{)765}$

10. $23\overline{)920}$

11. $30\overline{)810}$

12. $16\overline{)464}$

13. $53\overline{)954}$

14. Use the table. What is the total amount of electricity a computer, a television, and a heater use in 1 hour? Show your work.

Electricity Used	
Appliance	**Kilowatts Per Hour**
Computer	0.09
Heater	1.5
Light bulb	0.1
Television	0.3

DATA

15. **Number Sense** How many hours does it take for a light bulb to use as much electricity as a heater uses in 1 hour?

16. The cost of each plane ticket for the Baltazar family's summer vacation is $329. If there are 7 family members, what is the total cost of the plane tickets?

17. © **MP.2 Reasoning** Shannon biked in an endurance cycling race. She traveled 2,912 miles and biked about 95 miles each day. About how many days did it take her to complete the race?

18. **Algebra** Twelve buses bring a total of 420 people to The Alhambra in Granada, Spain. Each bus carries the same number of people. How many people are on each bus? Write and solve an equation to find p, the number of people on each bus.

19. **Higher Order Thinking** How can you use partial quotients to find $684 \div 57$? Explain.

> Use an estimate to see if your answer makes sense.

© **Common Core Assessment**

20. Which expressions are equivalent to 28?

- ☐ $980 \div 35$
- ☐ $480 \div 16$
- ☐ $1,400 \div 50$
- ☐ $625 \div 25$
- ☐ $1,680 \div 60$

21. Which expressions are equivalent to 53?

- ☐ $1,680 \div 40$
- ☐ $2,385 \div 45$
- ☐ $1,612 \div 62$
- ☐ $3,127 \div 59$
- ☐ $3,763 \div 71$

5:5 ... divide by multiples of ten.
or! "The standard way!"

Algorithm for Long Division

① Look Down 👀

÷ Divide ①

× Multiply ②

− Subtract ③

↓ Drop Down ④

Example:

$$
\begin{array}{r}
155 \text{ R2} \\
3\overline{)467} \\
-3 \\
\overline{16} \\
-15 \\
\overline{17} \\
-15 \\
\overline{2}
\end{array}
$$

5:1

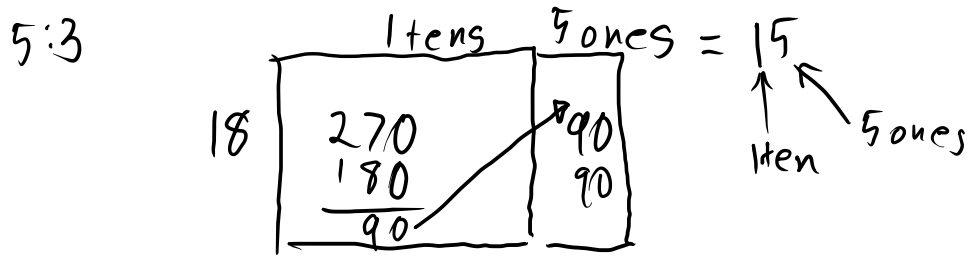$$8 \div 4 = \enclose{circle}{2} \leftarrow$$

$$80 \div 40 = 2$$

$$8 \div 4 = 2$$

$$80 \div 4 = 20$$

$$800 \div 4 = 200$$

5:2

$$228 \div 19$$
$$\downarrow \qquad \downarrow$$
$$220 \div 20 = 11$$

5:3

1 tens   5 ones = 15

18 | 270 | 90
    | 180 | 90
    | 90

1 ten   5 ones

5:4

$$\begin{array}{r} 5 \leftarrow \\ 10 \leftarrow = 15 \\ 18\overline{)270} \\ 180 \\ \hline 90 \\ 90 \\ \hline 0 \end{array}$$

5:5

$$270 \div 18 =$$

$$\begin{array}{r} \times \enclose{circle}{15} \\ 18\overline{)270} \\ -18\downarrow \\ \hline 90 \\ 90 \\ \hline 0 \end{array} \quad ?$$

$$\begin{array}{r} 4 \\ 18 \\ \times 6 \\ \hline 108 \end{array}$$

$$\begin{array}{r} 18 \\ \times 5 \\ \hline 90 \end{array}$$

① Divide
② Multiply
③ Subtract
④ check it
⑤ Drop it like its Hot

① $249 \div 20 = 12 \, r \, 9$

$$\begin{array}{r} \times \enclose{circle}{12\ r\ 9} \\ 20\overline{)249} \\ -20\downarrow \\ \hline 49 \\ -40 \\ \hline 9 \end{array}$$

5:1

$60 \div 20 = 3$

$6^{\times 2} \div 2^{\times 2} = 3$

$12 \div 4 = 3$

$$\text{dividend} \div \text{divisor} = \text{quotient}$$

$$\text{divisor} \overline{)\text{dividend}}^{\;\text{quotient}}$$

5:2

$228 \div 19$

$\downarrow$

$200 \div 20 = 10$

5:3

	1 tens	5 ones = 15
18	270 180 90	90 90 0

5:4

$$
\begin{array}{r}
5 \leftarrow \\
1\,0 \leftarrow = 15 \\
18\overline{)270} \\
180 \\
\hline
90 \\
90 \\
\hline
0
\end{array}
$$

5:5

$$
\begin{array}{r}
\times\; 1\,5 \\
18\overline{)2\,'7\,0} \\
-18\downarrow \\
\hline
90 \\
90 \\
\hline
0
\end{array}
\qquad
\begin{array}{r}
\times\; 1\,2\; r\,9 \\
20\overline{)2\,4\,9} \\
-20\downarrow \\
\hline
49 \\
-40 \\
\hline
9
\end{array}
$$

Name _____

Solve & Share

Cameron's soccer team has $168 to buy uniforms that cost $20 each. How many uniforms can his team buy? Will there be any money left over? *Solve this problem any way you choose.*
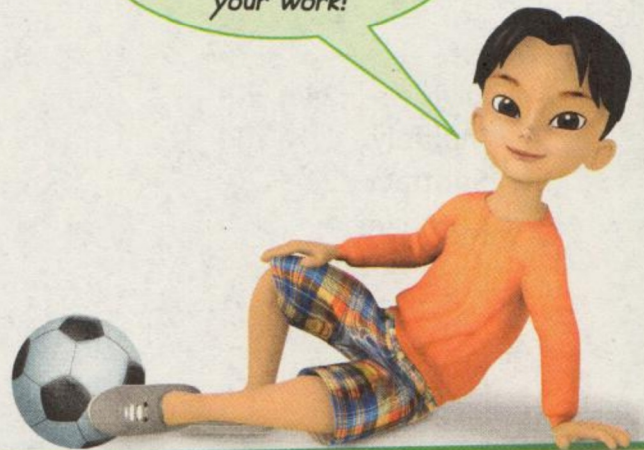
I can ...
find the quotient when the divisor is a multiple of 10.

© **Content Standard** 5.NBT.B.6
Mathematical Practices MP.1, MP.2, MP.3, MP.4, MP.7, MP.8

Generalize Think how estimation and multiplication might be used. *Show your work!*

Look Back! © **MP.2 Reasoning** How much more money is needed to buy an additional uniform?

Essential Question: What Are the Steps in Dividing by a Multiple of Ten?

A

This year, a group of 249 students is taking a field trip. One bus is needed for every 20 students. How many buses are needed?

> 20 students per bus

> You can divide to find how many 20s are in 249.

B Step 1

Find $249 \div 20$.

Estimate: $240 \div 20 = 12$

$$
\begin{array}{r}
1 \\
20\overline{)249} \\
-\ 20 \\
\hline
4
\end{array}
$$

Divide $24 \div 20$
Multiply 1×20
Subtract $24 - 20$
Compare $4 < 20$

C Step 2

Bring down the ones. Divide the ones.

$$
\begin{array}{r}
12\ \text{R}9 \\
20\overline{)249} \\
-\ 20\downarrow \\
\hline
49 \\
-\ 40 \\
\hline
9
\end{array}
$$

Divide $49 \div 20$
Multiply 2×20
Subtract $49 - 40$
Compare $9 < 20$

Since there is a remainder, one more bus is needed. A total of 13 buses is needed.

The answer is reasonable because 13 is close to the estimate.

Convince Me! © MP.3 Construct Arguments For the example above, show how you can check that the quotient is correct. Explain your answer.

Guided Practice *

Do You Understand?

1. In the example at the top of page 264, if only 137 students were going on the trip, how many buses would be needed?

2. © MP.2 Reasoning In the example at the top of page 264, why is 12 buses a reasonable estimate?

Do You Know How?

In **3** and **4**, divide. Write the missing numbers.

3.
```
        □ □
   20 ) 2 8 0
      - □ □
        ─────
           8 □
        - 8 0
        ─────
             0
```

4.
```
        x x 9  R 46
   80 ) 7 6 6
      - 7 2 0
        ─────
           4 6
```

An estimate can help you decide if your answer is reasonable.

Independent Practice *

Leveled Practice In **5–13**, divide. Write the missing numbers.

5.
```
        □ 5
   20 ) 3 0 0
      - 2 □
        ─────
        □ 0 □
      - 1 □ □
        ─────
            □
```

6.
```
          □ R □
   60 ) 5 9 3
      - □ □ □
        ───────
          □ □
```

7.
```
        □ □
   30 ) 3 6 0
      - □ □
        ─────
        □ □
      - □ □
        ─────
           □
```

8. 40)453

9. 50)250

10. 70)867

11. 60)720

12. 80)492

13. 40)375

Math Practices and Problem Solving

14. © MP.2 Reasoning Rita's family is moving from Grand Junction to Dallas. The moving van averages 60 miles each hour. About how many hours does the van take to reach Dallas? Explain your work.

15. Due to construction delays on the trip from Little Rock to Chicago, a van driver averaged 50 miles each hour. About how long did that trip take?

16. Higher Order Thinking A scientist needs 70 milliliters of distilled water for each of 15 experiments. She has a bottle that contains 975 milliliters of distilled water. Is there enough water in the bottle for all 15 experiments? Explain.

17. MP.4 Model with Math The Port Lavaca fishing pier is 3,200 feet long. There is one person fishing for every ten feet of length. Write and solve an equation to find how many people are fishing from the pier.

18. © MP.1 Make Sense and Persevere
Todd made a table to show different plans he can use to save $500. Complete the table. Which plan can Todd use to save $500 in less than 16 weeks and have $20 extra? Explain how you found your answer.

Plans for Saving $500		
Plan	Amount to Save Each Week	Number of Weeks Needed to Make Goal
A	$20	25
B	$30	
C	$40	
D	$50	

© Common Core Assessment

19. Find an expression that gives a quotient of 9 R15. Write the expression in the box.

Quotient: 9 R15
335 ÷ 40   360 ÷ 40   365 ÷ 40
375 ÷ 40   409 ÷ 40   415 ÷ 40

Help Practice Buddy Tools Games

Another Look!

Bo has 623 bottle caps to divide equally among 40 friends. How many caps will each friend get? Will there be any caps left?

Step 1	**Step 2**	**Step 3**	**Step 4**
Divide the tens.	Subtract the tens. Bring down the ones.	Divide the ones.	Subtract the ones. Write the remainder.
1 $40\overline{)623}$ ← 62 tens ÷ 4040 40×1 ten = 40 tens	1 $40\overline{)623}$ $-40\!\downarrow$ 223	15 $40\overline{)623}$ -40 223 ← 223 ones ÷ 20040 40×5 ones = 200 ones	15 R 23 $40\overline{)623}$ -40 223 -200 23 Each friend will get 15 caps and 23 caps will be left.

Leveled Practice In **1–8**, find the quotient.

Remember to compare the remainder to the divisor.

1. ☐☐ R ☐
    20⟌3 5 9
    −☐☐↓
    ☐☐☐
    −☐☐☐
    ☐☐

2. ☐☐
    30⟌4 8 0
    −☐☐
    ☐☐☐
    −☐☐☐
    ☐

3. 40⟌7 4 6

4. 50⟌8 0 0

5. 70⟌6 3 2

6. 60⟌7 7 9

7. 40⟌9 2 0

8. 30⟌3 3 2

9. © **MP.7 Use Structure** Why can the calculations in red be thought of as simpler problems? Describe the simpler problems.

```
        1 2 R 13
   80 ) 9 7 3   ←── 97 tens ÷ 80 groups
     − 8 0       ←── 80 × 1 ten
       1 7 3     ←── 173 ones ÷ 80 groups
     − 1 6 0     ←── 80 × 2 ones
         1 3
```

10. © **MP.3 Construct Arguments** A county has 90 schools. The county received 992 new computers. Are there enough computers so that each school can get 11 new computers? Explain.

---

11. Twin Oaks Soccer Field is a rectangle. The longer side of the field is 108 yards long. What is the perimeter of the field?

---
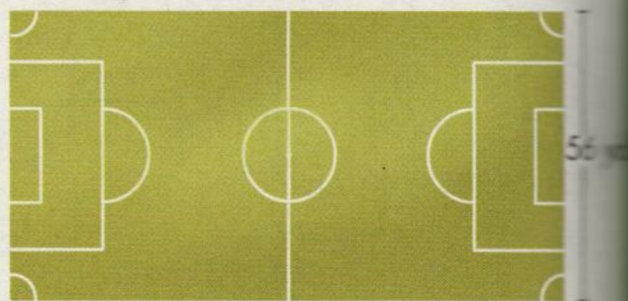
12. **Higher Order Thinking** Liza makes 20 minutes of phone calls each day. Which plan will give Liza enough minutes for June, with between 30 and 50 minutes left? Show your work.

13. Mark and his brother signed up for the Catch Up phone plan. They share the minutes every month equally. How many minutes can Mark use each day without going over his share of minutes?

Speed Link Company Phone Plans

Plan Name	Number of Minutes Per Month
Connect	550
Chat	625
Share	650
Catch Up	700

© **Common Core Assessment**

14. Find an expression that gives a quotient of 16. Write the expression in the box.

Quotient: 16

$600 \div 40$ $620 \div 40$ $640 \div 40$
$644 \div 40$ $660 \div 40$ $680 \div 40$

5.6 ... decide where to place the first digit of the quotient when I divide whole numbers.

1 = 1 digit
10 = 2 digit.
100 = 3 digits

How many digits are in our quotient.

dividend ÷ divisor = quotient.

$615 \div 15 = ?$

$360 \div 45$

$4,945 \div 23$

$8,589 \div 21$

$4,674 \div 82$

$8,827 \div 91$

$7752 \div 76$

①
②
③

$15 \times 1 = 15$
$15 \times 10 = 150$
$15 \times 100 = 1,500$

45
450

$$1 \times \times$$
$$76\overline{)7752}$$

$$1 \times$$
$$91\overline{)8827}$$

Solve & Share

Marty's teacher asked the students to predict how many digits are in the quotient of a division problem. All of the quotients are whole numbers. Draw lines to the buckets to show how the students should sort the cards. **Do not solve the problems.** Use reasoning, number sense, and estimation to make your decisions.
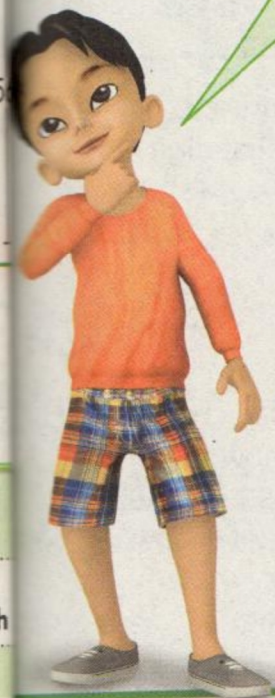
I can ...

decide where to place the first digit of the quotient when I divide whole numbers.

Content Standard 5.NBT.B.6
Mathematical Practices MP.1, MP.2, MP.3, MP.7

Use Structure In each problem, how does the dividend compare to 10 times the divisor and 100 times the divisor?

1 - digit quotient

2 - digit quotient

3 - digit quotient

615 ÷ 15

360 ÷ 45

4,945 ÷ 23

8,589 ÷ 21

4,674 ÷ 82

8,827 ÷ 91

7,752 ÷ 76

Look Back! MP.7 Use Structure Will the quotient 7,825 ÷ 25 be greater than 100 or less than 100? How do you know?

How Can You Decide Where to Place the First Digit of a Quotient?

Essential Question

A

Jake works at a flower shop. The shop just received a delivery of 2,535 roses. Jake divides 2,535 by 12 to find the number of bouquets he can make. Where should he place the first digit of the quotient?

You can **use structure** to decide where to place the first digit of the quotient. Think about the relationship between multiplication and division.

Rose Bouquet
1 dozen roses

B Multiply by powers of 10 to estimate.

$12 \times 10 = 120$

$12 \times 100 = 1,200$

$12 \times 1,000 = 12,000$ ← 2,535

Since 2,535 is between 1,200 and 12,000, the quotient is between 100 and 1,000.

C The quotient is in the hundreds, so Jake should place the first digit in the hundreds place.

$12\overline{)2,535}$

Use compatible numbers to check. Since $24 \div 12 = 2$, you know that $2,400 \div 12 = 200$. So, $2,535 \div 12$ will be about 200. The quotient will have 3 digits.

Convince Me! © **MP.2 Reasoning** Can Jake make at least 100 bouquets? Can Jake make at least 1,000 bouquets? Explain.

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of the fi

6. $16\overline{)3,}$

In **9–14**

write th

9. 7,905

12. $46\overline{)87}$

For another

Another Example

Where should you place the first digit of the quotient 4,108 ÷ 80?

$80 \times 10 = 800$

$80 \times 100 = 8,000$ ← 4,108

$80 \times 1,000 = 80,000$

Since 4,108 is between 800 and 8,000, the quotient is between 10 and 100.

The quotient is in the tens, so place the first digit in the tens place.

Guided Practice

Do You Understand?

1. In which place should you write the first digit of the quotient 3,710 ÷ 18? Complete the following to help you decide.

   $18 \times 10 =$

   $18 \times 100 =$

   $18 \times 1,000 =$

Do You Know How?

In **2–5**, without completing the division problem, tell in which place to write the first digit of the quotient.

2. 4,632 ÷ 15   3. 3,332 ÷ 30

   ③ 100's

4. 25)1,013   5. 40)916   10's

   tens

Independent Practice

In **6–8**, without completing the division, shade a box to show the placement of the first digit of the quotient.

6. 16)3,4 1 8   7. 50)1,5 7 7   8. 24)8,0 4 5

In **9–14**, without completing the division, tell in which place to write the first digit of the quotient.

9. 7,905 ÷ 35   10. 5,500 ÷ 90   11. 2,838 ÷ 11

   100s   tens   100's

12. 46)875   13. 28)1,240   14. 18)6,020

   10's   10's   100's

Math Practices and Problem Solving

15. Number Sense The booster club picked 1,370 apples. They plan to sell bags of apples with 15 apples in each bag. Can they make at least 100 bags? How do you know?

16. © MP.1 Make Sense and Persevere Mason teaches ice skating. He earns $24.50 per lesson. How much does he earn in 5 days if he gives 6 lessons per day?

17. © MP.2 Reasoning A delivery to the flower shop is recorded at the right. The shop makes centerpiece arrangements using 36 flowers that are all the same type. Will they be able to make at least 10 arrangements using each type of flower? At least 100 arrangements? Explain.

580 tulips
2,410 daisies
4,000 carnations
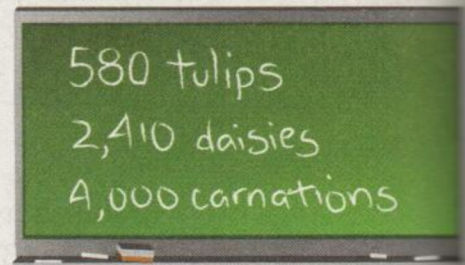
18. © MP.3 Construct Arguments Amelia and Ben have two different answers for 1,955 ÷ 85. Without dividing, how can you tell who might be correct?

Amelia: 1,955 ÷ 85 = 23
Ben: 1,955 ÷ 85 = 203

19. Higher Order Thinking Tell where you should place the first digit of the quotient 4,839 ÷ 15. Then determine the first digit and explain how you decided.

© Common Core Assessment

20. In which place should you write the first digit of the quotient 5,075 ÷ 38? How can you determine that without using division?
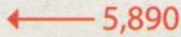
Name _____

Another Look!

In which place should you write the first digit of the quotient 5,890 ÷ 65?

$65 \times 10 = 650$

$\longleftarrow 5,890$

$65 \times 100 = 6,500$

$65 \times 1,000 = 65,000$

Since 5,890 is between 650 and 6,500, the quotient is between 10 and 100.

The quotient is in the tens, so write the first digit in the tens place.

> You can use the relationship between multiplication and division to help you.

1. Since $43 \times 10 =$ __430__ , $43 \times$ ⟨100⟩ $=$ __4,300__ , and

   $43 \times 1,000 =$ __43,000__ , the first digit of the quotient of $5,813 \div 43$ is

   in the __100s__ place.

In **2–4**, without completing the division, shade a box to show the placement of the first digit of the quotient.

2. 11)2,0 1 4

3. 34)7,0 0 6   ×

4. 70)5,5 9 1

In **5–13**, without completing the division, tell in which place to write the first digit of the quotient.

5. $1,620 \div 18$
   tens

6. $4,400 \div 30$ Hundred
   30)4,400

7. $8,899 \div 61$
   Hundreds

8. 40)8,175
   Hundreds

9. 28)770   tens

10. 14)1,726
    Hundreds

11. 75)688
    Ones

12. 29)5,123   Hundred

13. 17)1,699
    Tens

14. Number Sense Will the quotient 7,818 ÷ 25 be greater than 100 or less than 100? How do you know?

[handwritten] 3個零
$25\overline{)7818}$ Greater!

Because 25 fits into 78 three times meaning the quotient is much bigger than 100.
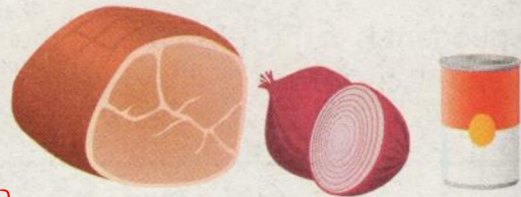
15. © MP.2 Reasoning Choose the best estimate for 2,819 ÷ 13 from the following:

100   (200)   500

How did you decide?

[handwritten] 13 x 2 is 26 so 9 would start with 2 in the hundreds place.

---

16. MP.1 Makes Sense and Persevere Jordan bought 1.8 pounds of ham, 2.15 pounds of onions, and 8 cans of soup. What was the total cost before sales tax? Round your answer to the nearest cent.

17. The sales tax for the food Jordan bought is $0.87. He has a coupon for $1.75 off any purchase. Use your answer for Exercise 16 to find the final amount Jordan needs to pay.

[handwritten]
$17.42
+ 2.87
$18.19
- 1.75
$16.34

Ham $3.95 per pound	Onions $0.89 per pound	Soup $1.05 per can

[handwritten calculations]
3.95 × 1.8 = $7.11
2.15 × 0.89 = $1.91
1.05 × 8 = $8.40

7.11
1.91
8.40
17.42

$17.42

---

18. © MP.3 Construct Arguments Does each quotient have the same number of digits? Explain how you can tell without dividing.

3,444 ÷ 42
4,368 ÷ 42

[handwritten] no

The first one, 34 is smaller than 42 so there will be 2 digits. The second one, 43 is larger than 42 so there will be 3 digits.

19. Higher Order Thinking There are 347 students going on a field trip. Each bus holds 44 students. If each bus costs $95. Is the total cost of the buses more than $1,000? How can you decide without using division?

[handwritten] $44\overline{)350}$ 9 x 95 = is way less than 1000.

© Common Core Assessment

20. In which place should you write the first digit of the quotient of 3,381 ÷ 47? How can you determine that without using division?

[handwritten] The tens place because Mr Coppington is the best teacher in the world and taught me where to place the first digit of my quotient.

Topic 5 | Lesson 5-6   © Pearson Education, Inc. 5

5.7 . . . use estimation to decide if a quotient is reasonable when dividing by 2-digit divisors.

5:8

① What do you know?

② What are you trying to find?

③ How are the quantities related?
What is the answer to the problem?
Write equations to show your work.

① Divide
② Multiply
③ Subtract
④ Check.....
⑤ Then drop it
like it's hot.

Name _____

☆ Solve & Share ☆

A bakery needs to make a batch of 198 bagels. Each baking sheet holds the same number of bagels. How many baking sheets are needed? Solve this problem any way you choose.

I can ...

use estimation to decide if a quotient is reasonable when dividing by 2-digit divisors.

© **Content Standard** 5.NBT.B.6
Mathematical Practices MP.1, MP.2, MP.4

You can **make sense and persevere** by using rounding or compatible numbers. *Show your work!*

18 bagels per sheet

Look Back! © **MP.2 Reasoning** How did your estimate help you find the quotient?

Essential Question

How Can You Use Estimation to Decide if Your Quotient Is Reasonable?

A

Orchard workers have grapefruit seedlings to plant in 23 equal rows. How many seedlings will be in each row?

828 grapefruit seedlings

You can use compatible numbers to estimate 828 ÷ 23.

B ## Step 1

828 is about 800.
23 is about 20.

800 ÷ 20 = 40

The first digit is in the tens place. Start dividing tens.

$$\begin{array}{r} 4 \\ 23\overline{)828} \\ -92 \end{array}$$

The estimate is too high.

C ## Step 2

Try 3

$$\begin{array}{r} 3 \\ 23\overline{)828} \\ -69 \\ \hline 13 \end{array}$$

Bring down the ones. Continue dividing.

$$\begin{array}{r} 36 \\ 23\overline{)828} \\ -69 \\ \hline 138 \\ -138 \\ \hline 0 \end{array}$$

D ## Step 3

Compare your answer to the estimate.

There will be 36 grapefruit seedlings in each row.

36 is close to 40. So the answer is reasonable.

Convince Me! **MP.2 Reasoning** In Step 1 above, how do you know the estimate is too high? Explain.

Name

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5. 18

In 8–1
estima

8. 54

2. 7,70

For anoth

Name _____

Guided Practice

Do You Understand?

1. Can the remainder be greater than the divisor? Why or why not?

2. How can you use estimation to check if a quotient is reasonable?

Do You Know How?

3. Estimate 452 ÷ 21.

   $460 ÷ 20 = 23$

4. Complete.

   21 R11

   $21\overline{)452}$
   $-42↓$
   $\quad 32$
   -21
   $\quad 11$

   Remember to check that your answer is reasonable.

Independent Practice

Leveled Practice For **5–7**, fill in the boxes.

5. $18\overline{)468}$
   $-\square\square$
   $\quad\square\square\square$
   $-\square\square\square$
   $\quad\quad\square$

6. $94\overline{)658}$
   $-\square\square\square$
   $\quad\quad\square$

7. $41\overline{)9227}$ R☐
   $-\square\square$
   $\quad\square\square\square$
   $-\square\square$
   $\quad\square\square\square$
   $-\square\square\square$
   $\quad\quad\square$

In **8–15**, estimate and then find the quotient. Use your estimate to check for reasonableness.

8. $54\overline{)378}$ $\times 7$
   7
   $\dfrac{378}{0}$

9. $83\overline{)664}$

10. $761 ÷ 5$

11. $510 ÷ 30$

12. $7,704 ÷ 24$

13. $7,830 ÷ 33$

14. $3,136 ÷ 64$

15. $6,253 ÷ 71$

Math Practices and Problem Solving

For **16–18**, use the table at right.

16. **© MP.1 Make Sense and Persevere**
Bob's Citrus and Nursery sells citrus gift cartons. They have 5,643 oranges to pack into gift cartons. How many cartons can they fill?

Bob's Citrus Gift Cartons

Citrus Fruit	Number per Carton
Grapefruits	18
Oranges	24
Tangelos	12

17. Of the 4,325 grapefruits harvested so far, Bob's has sold 1,250 of them at a farmer's market. How many gift cartons can Bob's fill with the remaining grapefruits? How many grapefruits will be left?

18. Bob's sells tangelo gift cartons each December. Last year, they shipped a total of 3,300 tangelos. If each carton sells for $28, how much money did Bob's earn from the tangelo gift cartons sold?

19. **Higher Order Thinking** A period of 20 years is called a *score*. The Statue of Liberty was dedicated in 1886. About how many scores ago was that?

20. **© MP.4 Model with Math** At an automobile plant, each car is inspected by 34 different workers before it is shipped to a dealer. One day, workers performed 9,690 inspections. How many cars were shipped? Explain.

9,690

?
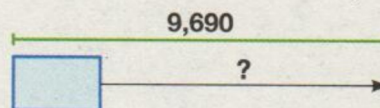
© Common Core Assessment

21. For which division problems is 46 the quotient? Write those division problems in the box.

Quotient = 46

$10\overline{)4,600}$ $21\overline{)966}$ $53\overline{)2,385}$
$43\overline{)946}$ $46\overline{)2,116}$

Name _____

Help   Practice   Tools   Games
      Buddy

Homework
& Practice 5-7
Divide by 2-Digit
Divisors

Another Look!

At the driving range, golfers can rent buckets of 32 golf balls. The range has a supply of 2,650 golf balls. How many buckets are needed for the balls?

Use compatible numbers to estimate 2,650 ÷ 32. You can use 2,700 ÷ 30 = 90.

Use the estimate to place the first digit in the quotient.	Complete the division.	They can fill 82 buckets with golf balls. They need 1 more bucket for the 26 balls that are left. So the range needs 83 buckets.
$$\begin{array}{r} 9 \\ 32\overline{)2,650} \\ -2\,88 \end{array}$$ The estimate is too high because 288 > 265. Try 8. $$\begin{array}{r} 8 \\ 32\overline{)2,650} \\ -2\,56 \end{array}$$	$$\begin{array}{r} 82\ R26 \\ 32\overline{)2,650} \\ -2\,56 \\ \hline 90 \\ -64 \\ \hline 26 \end{array}$$	83 is close to 90, so the answer is reasonable.

Leveled Practice In **1–4**, fill in the boxes.

1. $2\square$ R $\square$
   $42\overline{)9\,2\,6}$

2. $\square\square$
   $38\overline{)1,5\,5\,8}$

3. $\square$
   $77\overline{)6\,9\,3}$

4. $\square\square\square$ R $\square$
   $21\overline{)2,5\,6\,7}$

In **5–16**, estimate and then find the quotient. Use your estimate to check reasonableness.

5. $462 \div 77$

6. $44\overline{)817}$

7. $21\overline{)777}$

8. $35\overline{)280}$

9. $2,465 \div 29$

10. $203 \div 29$

11. $8,114 \div 46$

12. $13\overline{)1,748}$

13. $6,264 \div 87$

14. $5,578 \div 68$

15. $9,855 \div 45$

16. $7,308 \div 12$

17. © **MP1. Make Sense and Persevere**
A farmer has 4,700 carrots to put in bunches of 15 carrots. He plans to sell the carrots for $5 per bunch at his farm stand. About how many bunches will the farmer make?

Is there information you don't need?
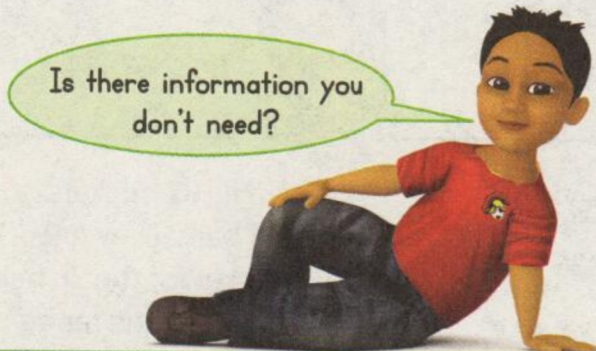
18. **Higher Order Thinking** You are dividing 3,972 by 41. Explain why the first digit in the quotient should be placed over the tens place of the dividend.

19. A-Z **Vocabulary** Write a division story problem with 53 as the divisor and 2,491 as the dividend. Solve.

20. © **MP.2 Reasoning** How can estimating the quotient help you check that your answer to a division problem is reasonable?

21. **Number Sense** Maya has 462 pennies. Use mental math to find how many pennies are left if she puts them in stacks of 50 pennies. Explain your reasoning.

22. © **MP.4 Model with Math** A caravan crossed 1,378 miles of desert in 85 days. It traveled 22 miles on the first day and 28 miles on the second day. If the caravan traveled the same number of miles on each of the remaining days, how many miles did it travel on each of those days? Complete the bar diagram to show how you found the answer.

number of days → [ ]   ?

© **Common Core Assessment**

23. For which division problems is 54 the quotient? Write those division problems in the box.

Quotient = 54

45)2,430   12)660   81)3,645
11)594   19)950

are dividin
first digit in
d over the

Name _____

 Solve

Solve & Share

There are 120 students in a school's marching band. They march in an array with the same number of students in each row. What are the dimensions of the different arrays that the band can form?

I can ...
make sense of problems and keep working if I get stuck.

© **Mathematical Practices** MP.1, Also MP.2, MP.3, MP.4, MP.6, MP.7
Content Standard 5.NBT.B.6

Thinking Habits

Be a good thinker!
These questions can help you.

- What do I need to find?
- What do I know?
- What's my plan for solving this problem?
- What else can I try if I get stuck?
- How can I check that my solution makes sense?
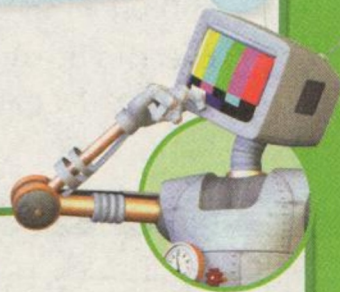
Look Back! © **MP.7 Use Structure** How can finding the arrays for 12 band members help you solve the above problem?

Essential Question **How Can You Make Sense of Problems and Persevere in Solving Them?**

A

For 3 months, a fifth-grade class raised money for charities. If the class divides the money equally among 30 different organizations, how much will each organization receive?

Funds Raised	
September	$435
October	$450
November	$615

DATA

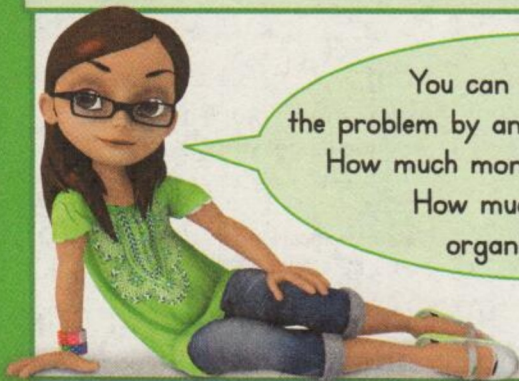You can make sense of the problem by answering these questions. How much money was raised in all? How much should each organization get?

B **How can I make sense of and solve the problem?**

I can

- identify the quantities given.
- understand how the quantities are related.
- choose and implement an appropriate strategy.
- check to be sure my work and answer make sense.

C

Here's my thinking...

First, I can write an equation to find the total amount raised:

$435 + $450 + $615 = $1,500.

Next, I can write a division equation to model equal sharing:

$1,500 ÷ 30 =

I can use mental math to find the quotient:

150 tens ÷ 3 tens = 50

So, each organization will receive $50.

Convince Me! **MP.3 Critique Reasoning** Julio says that you can solve this problem by dividing each month's total by 30 and then adding the three quotients together. Do you agree? Do you think his approach is easier or harder? Justify your answer.

Stuck? Try solving a simpler problem.

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MP.1

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For anoth

☆ Guided Practice*

MP.1 Make Sense and Persevere

Dana starts with 875 stamps in her stamp collection. Her grandparents give her 332 stamps. Then she buys 72 more. How many pages in her scrapbook can she fill?
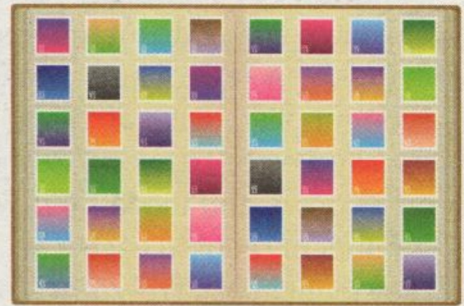
$$\begin{array}{r} 875 \\ 332 \\ + 72 \\ \hline 1{,}279 \end{array}$$

24 stamps on a page

1. What do you know?

24 stamps to a page.
1,279 stamps.

2. What are you trying to find?

How may pages of stamps.

3. How are the quantities related? What is the answer to the problem? Write equations to model your work.

$$24\overline{)1{,}279} \quad 53 \text{ R7} \qquad 54 \text{ pages.}$$

☆ Independent Practice ☆

MP.1 Make Sense and Persevere

Tanya is saving for a vacation. She wants to have at least $75 for each of the 12 days of her trip. If she saves $85 each month for 10 months, will she save enough money?

4. Use the strategy of mental math to find the total amount she will save. Then write a division equation to see if she will save enough.

5. Jorge says he can solve this problem a different way. He says that he can compare 85 × 10 and 75 × 12. Do you agree? Explain your thinking.

Math Practices and Problem Solving

Common Core Performance Assessment

Pumpkin Patch Farms

The table shows the number of seeds the owners of Pumpkin Patch Farms received from different seed suppliers. Each of the pumpkins they harvest usually weighs between 10 and 12 pounds. There are 60 rows, and the farmers will plant the same number of seeds in each row. How many seeds will they plant in each row?

Seed Supplier	Number of Seeds
Sid's Seeds	1,220
Vicki's Seed Supply	750
Seeds and More	1,450

6. **MP.1 Make Sense and Persevere** What do you know? What are you trying to find?

7. **MP.2 Reasoning** How are the quantities in the problem related? What steps are needed to solve the problem?

8. **MP.4 Model with Math** Write equations with variables to represent the steps needed to solve the problem.

Think about the problem-solving strategies to help you!

9. **MP.6 Be Precise** Solve the equations and answer the question.

10. **MP.2 Reasoning** What strategy can you use to check that your answer makes sense?

Topic 5 | Lesson 5-8

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Name _____

Help Practice Buddy Tools Games

Homework & Practice 5-8
Make Sense and Persevere

Another Look!

Dex works at a dog adoption shelter. He has 4 large boxes of dog treats with 34 treats in each box and 3 small boxes with 28 treats in each box. How many bags of 20 treats can Dex make from all the treats?

You can use bar diagrams to model the steps you need to solve.

What Do You Know? There are 4 large boxes with 34 treats each and 3 small boxes with 28 treats each.

What Are You Trying to Find? The number of bags of 20 treats that Dex can make.

Use bar diagrams and equations to find the number of treats in the large and small boxes.

ℓ total treats in large boxes

| 34 | 34 | 34 | 34 |

$4 \times 34 = \ell, \ell = 136$ treats

s total treats in small boxes

| 28 | 28 | 28 |

$3 \times 28 = s, s = 84$ treats

Add to find the number of treats in all.

Divide to find the number of bags Dex can make with 220 treats.

Dex can make 11 bags of treats.

$136 + 84 = 220$

$220 \div 20 = b, b = 11$

In **1** and **2**, solve the multi-step problems.

1. A tropical storm has been moving at 15 miles per hour for the past two days. Bess recorded that the storm moved 135 miles yesterday and 75 miles today. For how many hours has Bess been keeping track of the storm? Draw a bar diagram and write equations to help you solve.

2. A parking garage has 6 levels. Each level has 15 rows. Each row has the same number of parking spaces. There are 2,250 parking spaces in all. How many parking spaces are in each row? Write an equation or equations to show your work.

Fruit Punch

Ana's fifth-grade class is making a large batch of punch for the all-day science fair. There are 25 students in Ana's class. The ingredients they mixed together to make the punch are listed on the recipe card. The class is going to pour 12-ounce servings. How many full servings can they make?

Fruit Punch Recipe	
Ingredient	Number of Ounces
Grape Juice	240
Apple Juice	480
Orange Juice	640
Ginger Ale	150

3. **MP.1 Make Sense and Persevere** What do you know? What are you trying to find?

4. **MP.2 Reasoning** How are the quantities in the problem related? What steps are needed to solve the problem?

5. **MP.4 Model with Math** Write equations with variables to represent the steps needed to solve the problem.

6. **MP.6 Be Precise** Solve the equations and answer the problem.

Think about the steps needed to solve the problem!

7. **MP.3 Critique Reasoning** Alejandro says that the division has remainder 10, so one more serving can be poured. Do you agree? Explain.

Point&Tally

Work with a partner. Get paper and a pencil. Each partner chooses light blue or dark blue.

At the same time, Partner 1 and Partner 2 each point to one of their black numbers. Both partners find the product of the two numbers.

The partner who chose the color where the product appears gets a tally mark. Work until one partner has seven tally marks.

I can ...
multiply multi-digit whole numbers.

© Content Standard 5.NBT.B.5

Partner 1

| 52 |
| 68 |
| 97 |
| 451 |
| 213 |

884	5,238	3,672	5,964
24,354	11,502	7,668	2,808
1,649	1,156	2,448	20,746
12,628	2,716	1,456	4,462
1,872	2,392	7,667	9,798
16,236	3,128	3,621	1,904

Partner 2

| 17 |
| 54 |
| 46 |
| 36 |
| 28 |

Tally Marks for Partner 1

Tally Marks for Partner 2

A-Z Glossary

Word List

- compatible numbers
- dividend
- divisor
- estimate
- multiple
- product
- quotient
- remainder

Name _____

Understand Vocabulary

Choose the best term from the Word List. Write it on the blank.

1. One way to estimate the answer to a division problem is to replace the divisor and dividend with _____.

2. The part that is left when you divide into equal groups is called the _____.

3. To decide where to place the first digit of a quotient, _____ the number of digits in the answer.

4. The answer to a division problem is the _____.

For each of these terms, give an example and a non-example.

	Example	Non-example
5. Multiple of 10	_____	_____
6. Product of 10	_____	_____
7. Quotient of 10	_____	_____

Use Vocabulary in Writing

8. Write a division problem with a 3-digit dividend, a divisor of 20, and remainder of 10. Use at least three of the terms in the Word List to explain how you chose the numbers for your example.

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Set A pages 239–244

Find 32,000 ÷ 80 using mental math.

Use basic facts and place-value patterns to help.

$32 \div 8 = 4$
$320 \div 80 = 4$
$3,200 \div 80 = 40$
$32,000 \div 80 = 400$

Reteaching

Remember to look for a basic division fact in the numbers. Check your answer by multiplying.

Find each quotient. Use mental math.

① $360 \div 40 = 9$ ② $270 \div 90 = 3$

③ $2,100 \div 30 = 70$ 4. $4,800 \div 80 = 60$

⑤ $72,000 \div 80 = 900$ ⑥ $81,000 \div 90 = 900$

Set B pages 245–250

Estimate 364 ÷ 57.

Use compatible numbers and patterns to divide.

$364 \div 57$
↓   ↓
$360 \div 60 = 6$

So, 364 ÷ 57 is about 6.

Remember that compatible numbers are numbers that are easy to compute mentally.

Estimate using compatible numbers.
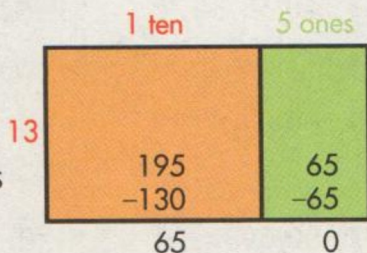
① $168 \div 45 =$
$150 \div 50 = 3$

② $525 \div 96$
$500 \div 100 = 5$

③ $379 \div 63$
$360 \div 60 = 6$

④ $234 \div 72$
$240 \div 80 = 3$

⑤ $\$613 \div 93$
$600 \div 100 = 6$

⑥ $\$748 \div 92$
$700 \div 100 = 7$

Set C pages 251–256

Find 195 ÷ 13.

Draw a model to help you find the number of tens and ones in the quotient.

	1 ten	5 ones
13	195 −130	65 −65
	65	0

1 ten + 5 ones = 15.

So, 195 ÷ 13 = 15.

Remember find the number of tens first, then find the number of ones.

Use a model to find each quotient.

1. $180 \div 15$ 1 ten 2ones
   12
   15 | 180   15 | 180
           $\frac{-15}{30}$

2. $154 \div 14$ 1tens 1ones
   11
   14 | 154
   $\frac{-14}{14}$
   14

3. $351 \div 27$ = 13
   1tens 3ones
   27 | 351   81
   $\frac{270}{081}$ $\frac{-81}{0}$

4. $192 \div 16$
   1tens 2ones = 12
   16 | 192   32
   $\frac{160}{32}$ $\frac{-32}{0}$

5. $143 \div 11$

6. $217 \div 31$

7. $130 \div 26$

8. $270 \div 18$

Set D | pages 257–262

Find 336 ÷ 21 using partial quotients.

```
     6
    10
21)336    Estimate: How many 21s in 336? Try 10.
  −210    Multiply 10 by 21 and subtract.
   126    Estimate: How many 21s in 126? Try 6.
  −126    Multiply 6 by 21 and subtract.
     0
```

Add the partial quotients: 10 + 6 = 16.

So, 336 ÷ 21 = 16.

Remember to add the partial quotients to find the actual quotient.

Use partial quotients to divide.

1. 30)570

2. 17)714

3. 24)984

4. 40)920

5. 13)858

6. 29)986

7. 35)980

8. 73)803

Set E | pages 263–268

Find 461 ÷ 50.

Estimate to decide where to place the first digit in the quotient.

Use compatible numbers. 450 ÷ 50 = 9

So, write 9 in the ones place of the quotient. Multiply and subtract. Compare the remainder to the divisor.

```
      9 R11
50)461
  − 450      Multiply 9 × 50 = 450
     11
```

So, 461 ÷ 50 = 9 R11. The quotient is close to the estimate, so the answer is reasonable.

Remember that you can check your answer by multiplying the quotient by the divisor, and then adding any remainder.

1. 20)420

2. 30)540

3. 40)387

4. 50)653

5. 60)840

6. 70)910

7. 80)698

8. 90)849

9. Ivan uses 30 craft sticks to make each toy cabin. He has a box of 342 craft sticks. How many toy cabins can Ivan make? How many sticks will be left?

Set F

Tell in w
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Multiply

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23 × 1
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Set G

Find 789

Estimate

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quotient

Set F pages 269–274

Tell in which place to write the first digit of the quotient 3,657 ÷ 23.

Multiply 23 by powers of 10 to estimate.

$23 \times 10 = 230$
$23 \times 100 = 2,300$
$23 \times 1,000 = 23,000$

Since 3,657 is between 2,300 and 23,000, the quotient is between 100 and 1,000.

So, the quotient is in the hundreds. Write the first digit of the quotient in the hundreds place.

Remember you can multiply the divisor by powers of 10 to estimate the quotient.

Reteaching
Continued

Without completing the division problem, tell which place to write the first digit of the quotient.

1. $14\overline{)966}$ 2. $53\overline{)6,519}$

3. $91\overline{)728}$ 4. $72\overline{)2,376}$

5. $26\overline{)8,164}$ 6. $68\overline{)612}$

7. $40\overline{)5,520}$ 8. $39\overline{)3,861}$

Set G pages 275–280

Find 789 ÷ 19.

Estimate first: $800 \div 20 = 40$.

So, the first digit of the quotient is in the tens place.

Divide the tens. Multiply, subtract, and compare.

Bring down the ones. Divide the ones. Multiply, subtract, and compare. Compare the quotient with your estimate.

$$\begin{array}{r} 41 \text{ R10} \\ 19\overline{)789} \\ -76 \\ \hline 29 \\ -19 \\ \hline 10 \end{array}$$

Remember that you can check your answer by multiplying the quotient by the divisor, and then adding any remainder.

1. $16\overline{)224}$ 2. $38\overline{)792}$

3. $42\overline{)504}$ 4. $47\overline{)5,170}$

5. $58\overline{)7,211}$ 6. $12\overline{)3,549}$

7. $25\overline{)1,352}$ 8. $33\overline{)1,500}$

9. $42\overline{)5,825}$ 10. $28\overline{)2,941}$

Think about these questions to help you **make sense and persevere** in solving problems.

Thinking Habits

- What do I know?
- What do I need to find?
- What's my plan for solving the problem?
- What else can I try if I get stuck?
- How can I check that my solution makes sense?
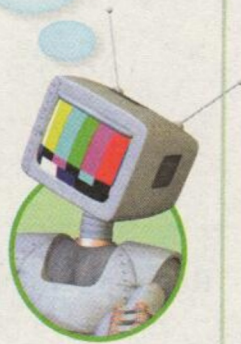
Selena is planning to visit her aunt in 5 weeks. She has saved $365 but thinks the trip will cost $500. She plans to save the same amount each week so she has $500 for the trip. How much does she need to save each week?

I can write an equation to find how much more money Selena needs:

$500 - 365 = 135$

Then divide the amount she needs by 5 weeks: $135 \div 5 = 27$

Selena needs to save $27 each week.

My answer is reasonable because $365 + 27 + 27 + 27 + 27 + 27 = 500$.

Remember to think about what steps are needed to solve each problem.

Solve. Show your work.

1. The football coach spent a total of $890 including $50 in tax for 35 shirts for the team. Each shirt cost the same amount. What was the price of one shirt before tax was added?

2. A gymnast practices 6 days each week. She practices the same number of hours each day. If she practices a total of 120 hours in a 4-week period, how many hours each day does she practice?

3. Nathan works the same number of hours each day, 5 days each week. He earns $12 per hour. Last week he earned $420. How many hours did he work each day last week? Write equations to model your work.

4. A high-rise apartment building has 15 floors with 26 apartments on each floor. There are 3 kinds of apartments in the building: 1-, 2-, and 3-bedroom. The building has the same number of each kind of apartment. How many of each kind of apartment are in the building? Show your work.

1. For questions 1a–1d, choose Yes or No to tell if the number 60 will make each equation true.

   1a. $420 \div \square = 70$ ○ Yes ○ No

   1b. $1{,}800 \div \square = 300$ ○ Yes ○ No

   1c. $5{,}400 \div \square = 90$ ○ Yes ○ No

   1d. $24{,}000 \div \square = 400$ ○ Yes ○ No

2. Which of the following is the best estimate of $487 \div 67$?

   Ⓐ 80

   Ⓑ 70

   Ⓒ 10

   Ⓓ 7

3. The carnival committee has purchased 985 small prizes. The prizes are to be divided equally among the 20 game booths.

   Part A

   In what place will the first digit of the quotient be?
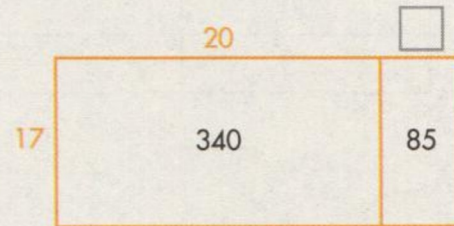

   Part B

   How many prizes will each booth have?

   Part C

   How many prizes will be left?

4. A rectangular living room has an area of 425 square feet. The width of the room is 17 feet.

   Write a number in the box to show the missing dimension.

   What is the length of the room?

   _____ feet

5. Choose all the expressions that are equal to $27{,}000 \div 30$.

   ☐ $270 \div 30$

   ☐ 270 tens $\div$ 3 tens

   ☐ 2,700 tens $\div$ 3 tens

   ☐ $2{,}700 \div 3$

   ☐ 2,700 tens $\div$ 30 tens

6. Five Star Farm purchased 2,400 apple trees. If 80 trees can be planted on each acre of land, how many acres will be needed to plant all the trees?

7. Use the table.

Plan	Amount to Save Each Week	Number of Weeks Needed
Althea's Plans for Saving $384		
A	$20	20
B	$30	
C	$50	8

Part A

Using Plan B, how many weeks will it take Althea to reach her savings goal? Write the missing number in the table.
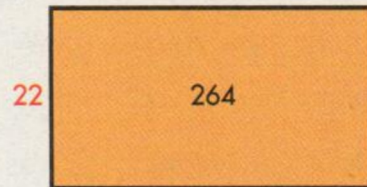
Part B

Show how you found your answer to Part A.

8. Draw lines to match each expression on the left to its quotient on the right.

420 ÷ 6	700
420 ÷ 60	7
4,200 ÷ 6	60
4,200 ÷ 70	70

9. Mrs. Reiss has 264 crayons for her art class of 22 students. How many crayons will each student get if the crayons are divided equally? Use the model.

22   264

10. Dan divides 16)‾608. In which place should he write the first digit of the quotient?

11. Kari wants to find 3,277 ÷ 29.

Part A

In which place should she write the first digit of the quotient?

Part B

Tell how you decided where to write the first digit of the quotient.

12. Th
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Ⓒ

Ⓓ

13. Sh
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Ⓑ

Ⓒ

Ⓓ

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12. The cost to rent a lodge for a family reunion is $975. If 65 people attend and pay the same price, how much does each person pay?

Ⓐ $16

Ⓑ $15

Ⓒ $14

Ⓓ $13

13. Shady Rivers summer camp has 188 campers this week. If there are 22 campers to each cabin, what is the fewest number of cabins needed?

Ⓐ 7 cabins

Ⓑ 8 cabins

Ⓒ 9 cabins

Ⓓ 10 cabins

14. The area of a rectangular banquet hall is 7,400 square feet. The length of one side of the hall is 82 feet. Explain how you can use compatible numbers to estimate the width of the hall.

15. The cost of renting a bus is $1,344. Tony wants to find how much each person will pay if 32 people ride the bus and share the cost equally. Fill in the partial quotients that are missing from Tony's work below.

$$32)\overline{1,344}$$
$$-1,280$$
$$64$$
$$-\quad 64$$
$$0$$

16. Jessie made 312 mini energy bars. She puts 24 bars in each bag. She plans to sell each bag for $6.

Part A

Write two equations with variables that Jessie can use to find the amount of money she will earn if she sells all of the bags.

Part B

How much will she earn if she sells all of the bags?

17. For questions 17a–d, choose Yes or No to tell if the number 40 will make each equation true.

17a. $280 \div \square = 7$ ○ Yes ○ No

17b. $800 \div \square = 20$ ○ Yes ○ No

17c. $4,000 \div \square = 10$ ○ Yes ○ No

17d. $32,000 \div \square = 800$ ○ Yes ○ No

---

18. Draw lines to match each expression on the left to its quotient on the right.

$2,700 \div 30$	9
$270 \div 30$	80
$2,400 \div 30$	90
$240 \div 30$	8

---

19. Charles burns 4,350 calories hiking 15 miles of the Appalachian Trail. He burns the same number of calories each mile. How many calories does he burn each mile?

---

20. Mary needs to find $432 \div 48$. In which place should she write the first digit of the quotient?

---

21. Which partial quotients could be added to find $465 \div 15$?

Ⓐ 20 and 1

Ⓑ 30 and 1

Ⓒ 30 and 9

Ⓓ 30 and 10

---

22. The table shows the number of students going on a field trip. One chaperone is needed for every 12 students.

Grade	Number of Students
Fifth Grade	310
Sixth Grade	305
Seventh Grade	225

Part A

Write two equations with variables that you can use to find the number of chaperones needed.

Part B

How many chaperones are needed?

Name _____

School

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School Supplies

A store had a sale on school supplies in August. The store manager recorded how many of several types of items were sold. Each of the same type of item cost the same amount. Use the information in the table to answer the questions.

© **Performance Assessment**

DATA	School Supply	Backpacks	Paper	Notebooks	Pens	Pencils
	Number Sold	60	616	432	568	784

1. Backpack sales totaled $1,200. How much did each backpack cost? Write an equation to model your work.

2. The store sold 71 packages of pens. Use compatible numbers to estimate how many pens were in each package. Show your work.

3. There were 16 pencils in each box. Olivia wants to find how many boxes of pencils were sold.

   Part A

   When Olivia divides 784 by 16, in which place should she write the first digit of the quotient? Tell how you know without dividing.
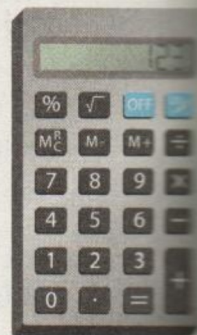
   Part B

   How many boxes of pencils were sold?

4. The store manager has ordered the calculators shown, but the shipment has been delayed.

Part A

If all the calculators ordered are sold, the total sales would be $2,014. Was the number of calculators ordered less than or greater than 100? How do you know without dividing?
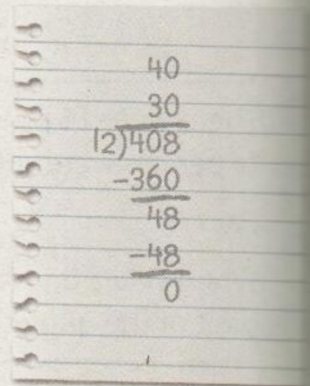
$19 for each calculator

Part B

How many calculators were ordered? Write an equation to model your work.

5. The manager wants to order 408 more notebooks. The notebooks are shipped in packages of 12. He used partial quotients to find the number of packages to order. His work is shown at the right. Is his solution correct? Explain.

```
        40
        30
   12)408
     -360
       48
      -48
        0
```

6. An additional 40 packages of paper were ordered at a total cost of $520. How much did each package of paper cost? Write an equation to model your work.